The Effects Of Reinforcement Context On The Effectiveness Of Social Consequences

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Abstract

The current study analyses the classroom social context; the rate of teacher task talk with respect to social consequences (praise and reprimand), in relation to the rate of on-task and unwanted behaviour of a target student in the classroom. Teacher behaviour talk (talk related to student conduct), social talk (social, non-academic talk) and proximity to the target student are also assayed. Teacher verbal behaviour was recorded towards whom it was addressed: to the whole class, to a target student, to other students, and analysed severally and combined (summed) in relation to student on-task and unwanted behaviour. Data were obtained by continuous recording of classroom behaviour and collated in to 60 second intervals. All correlations were calculated on seconds of occurrence of that behaviour per minute. This allowed for lagging the independent variable relative to dependent variables to better reflect the subsequent nature of the independent variable, such as praise and reprimand, rather than assaying contiguous relationships alone. Results indicated that teacher verbal behaviour directed toward the target student did not relate significantly with student on-task behaviour or student unwanted behaviour. The teacher verbal behaviour that related most significantly with both student on-task behaviour and student unwanted behaviour was teacher task talk to the whole class, followed by teacher task talk to the whole class, to the target student and to other students combined. Teacher reprimand and behaviour talk directed toward the target student did not relate significantly with student on-task or unwanted behaviour. Teacher reprimand and behaviour talk to the whole class, to the target student and to other students combined was significantly related to the decrease in student unwanted behaviour and increase in on-task behaviour given lag analysis for those teachers maintaining a high (greater than 50% of available time) rate of task talk. For teachers that did not do so, teacher verbal behaviour did not maintain significant relationships with student on-task or unwanted behaviour. Results for this lower rate of teacher task talk were characterized by variability both in student behaviour and teacher verbal behaviour. A case study was conducted increasing the general rate of teacher task talk which supported the above findings. These results indicate that there is substantial commonality between student behaviour within the classroom and that teacher talk to the whole class and combined (i.e. the sum of addressing the whole class, the target student and other students) is significantly more predictive of individual student behaviour than is

teacher talk directed to a target student alone. Teacher social talk was significantly related to teacher reprimand and behaviour talk. Teacher proximity to the target student was not significantly related to student on-task or unwanted behaviour. The findings are discussed in relation to previous research findings and teaching practice.

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1 Literature Review

1.1 Introduction

Considerable research attention has been directed toward teacher student interactions within the classroom particularly teacher approval (praise) and disapproval (reprimand), with children's behaviour seen as primarily under the control of praise, reprimands and attention, consequences which are readily deliverable (Van Houten & Doleys, 1983).

The focus of much of this research has been to describe the overall rates of approval and disapproval in the classroom as a whole in general classrooms, in special classes and with those students having significant problems (for example emotional and behavioural disorders).

Descriptive analyses, the unobtrusive observation of a defined or target behaviour in the natural setting (for example the home or classroom) offer useful information as to the dimensions (e.g., frequency, rate and duration), and possible functional relations for that behaviour in those settings (Thompson & Iwata, 2001).

These descriptive analyses have shown attention, particularly reprimands, to be the most common consequence for problem behaviour across institutional, classroom and home settings (Strain, Lambert, Kerr, Stagg & Lenkner; Shores, 1983; Nafpaktitis, Mayer & Butterworth, 1985; Rosen, Taylor, O'Leary & Sanderson, 1990; Jack, Gunter, Ellis, DeBriere & Wehby, 1993; Wilks, 1996; McKerchar & Thompson, 2004; Minton, Kagan & Levine, 1971; Schaffer & Crook, 1979). Further, that aggression is more likely to elicit attention (reprimand) than other problem behaviour (Thompson & Iwata, 2001). The focus of many of these descriptive analysis studies has been on the occurrence of praise, the importance of this derived from studies showing the effective treatment of problem behaviour with contingent praise for desired behaviour (Beaman & Wheldall, 2000). In the view of some writers, this singular focus has resulted in the neglect of other behaviour-consequence relations (Carr, 1994; Fantino, 2004).

The predominant teacher behaviour within the classroom setting is teacher instructional or academic talk (Wehby & Yoder, 2002). Teacher verbal behaviour in the classroom has received minimal research attention.

The Relationship between Descriptive and Functional Analyses and Difficulties Inherent in the Generalisation of Results

Functional analysis studies involve the experimental variation of antecedents and or consequences of the target behaviour across a series of test conditions (Camp et al., 2009; Wightman et al., 2014). Comparison of rates of behaviour within the experimental conditions, mostly graphical, with the naturally occurring rates of behaviour (baseline rates obtained from descriptive analysis) prior to the experimental manipulation indicates the effectiveness of the intervention, (McComas, et al., 2009).

Studies comparing outcomes from functional and descriptive analyses to determine whether similar functional relationships (antecedents or subsequent events) for problem behaviour can be identified have generally shown poor correspondence (Lerman & Iwata, 1993; Sasso et al., 1992; Thompson & Iwata, 2007; Pence et al., 2009).

Descriptive analyses have been used to find the extent that factors associated with established effective interventions for the individual student (e.g. praise), derived from functional analyses for problem behaviour, have been adopted in the wider environment such as the classroom (Thompson & Iwata, 2001). These analyses have generally shown a lack of implementation of research findings in the classroom setting (Beaman & Wheldall, 2000). This has been the case with praise, reprimands and opportunities to respond (OTRs).

In reviewing outcomes from descriptive and functional analyses of problem behaviour, Thompson and Iwata (2007) found that despite attention (usually reprimand) being the most common consequence for problem behaviour during descriptive analyses, for 8 of 12 participants in their study, functional analysis showed the maintenance of problem behaviour by attention was evident for only 2

of those 8 participants. Taylor et al. (1993) in a case in which low adult attention evoked excessive attention-seeking behaviour found that in limiting teacher attention, this problem behaviour was specific to the teacher talking to another adult and not to another child. This study provides a clear example of social context, other behaviour-consequence relations, influencing behaviour beyond the immediate behaviour-consequence relation. These studies caution against the adoption of functional relations deduced from descriptive analyses for subsequent functional analyses.

There are difficulties inherent in generalising from analogue functional analyses to the natural setting. For example, identifying controlling (independent) variables for behaviour in an 'experimental' context outside the classroom and introducing these in to the classroom (Thompson & Iwata, 2007). The contexts (individual compared with classroom), loci of control (therapist compared with teacher), and frequency and consistency of contingencies are substantially dissimilar. A commonly found effective independent variable, such as praise, may not necessarily be effective: given a high programmed rate of praise in a setting characterised by a low natural rate of occurrence (praise becoming disingenuous) as is the case in classrooms (Brophy, 1981); given that "some students lack a basic sensitivity to social reinforcement that provides the basis for socially mediated compliance" (Fisher, Ninness, Piazza & Owen-DeSchryver, 1996, p.249; Hanley, Iwata & Lindberg, 1999); without consideration for other potential social discriminative stimuli such as rates of teacher, parent or caregiver, task or instructional talk contiguous with or defining of behaviour at that time (Carr, 1994; Fantino, 2004), and the practicability of implementation (Mace, 1990). It is not possible to differentiate between praise and the more generic additional contingent and consistent attention, the relative reduction in reprimands and changed relative rates of attention towards 'unacceptable' social and 'desired' or academic behaviour these studies have invoked. For example, a high rate of praise indicates greater relative attention to desired behaviour, and high rate of reprimands and talk about conduct indicates greater relative attention to inappropriate behaviour. Studies (Arntzen, Breksta & Holth, 2005) showing the effectiveness of non-contingent or fixed-time reinforcement (attention) support this interpretation. There are, and always will be difficulties inherent in generalising from behaviour-

consequence relations derived from single subject design functional analyses and analogue functional analyses, and ascribing generalised strategy to a wider environment, for example as whole of class strategy within the classroom (Thompson & Iwata, 2007). These difficulties are further compounded by reported variability in functional analysis results.

Praise

Strain, Lambert, Kerr, Stagg and Lenkner (1983) pointed out that in the ten years preceding their descriptive analysis (and subsequently) that hundreds of functional analysis studies had shown social reinforcement (praise) to be effective at improving social and academic performance. Teacher praise has been found to be most effective when it is behaviour or task specific **(**Kirby & Shields, 1972; Gable & Shores, 1980; Fisher, Ninness, Piazza & Owen-De Shryver, 1996; Sutherland, Wehby & Copeland, 2000). Praise specific to academic behaviour has been found to reduce or eliminate behaviour problems (Ayllon & Roberts, 1974; Hundert, Bucher & Henderson, 1976; Hay, Hay & Nelson, 1977; Gunter, Jack, Shores, Carrell & Flowers, 1993; Lane, 1999). Despite these findings, Anderson, Everton and Brophy (1979) when looking at characteristics of effective teaching observed less than 5% of natural rates of teacher praise to be behaviour specific.

The notion of praise being fundamental to appropriate functioning and reprimand deleterious to appropriate functioning has not been as clear as these studies have suggested either within classroom or home settings. Roberts, Hatzenbuehler and Bean (1981) found with 32 preschool children that contingent attention (praise) resulted in decreasing compliance. A time-out contingency increased compliance (p.98). Further, Roberts (1985) found that following compliance training, previously non-compliant children remained compliant after the withdrawal of contingent praise.

Within home settings it has been found that, "Neither parent positive behaviour in general (Forehand, Roberts, Doleys, Hobbs & Resick, 1976) nor parent positive reinforcement for appropriate behaviour (Patterson, 1982) differs significantly between parents of conduct disordered clinic-referred children and

non-clinic children," (Forehand, 1987, p. 21). He concluded that, "Positive reinforcement is not sufficient to achieve or maintain behaviour change in deviant children … Praise was not discriminative of differences, mentoring or supervision was" (p. 21).

Cannella, O'Reilly and Lancioni (2006), in their literature review, noted a trend towards non-aversive treatment of behaviour problems. This change to a singular approach has both its proponents (LaVigna & Donnellan, 1986; LaVigna, Negri-Shoultz & Fassbender, 1988) and detractors (Lerman & Vorndran, 2002). Mace (1990) described difficulties with implementation and consistency and hence the effectiveness of these non-aversive or positive programming approaches. Bailey (2006) has been critical of the validity of the premise on which LaVigna bases his assertions, in that they rarely relate to severe problem behaviour.

Variability in response to praise and reprimands is well reported (Piazza, Bowman, Contrucci, Delia, Adelinis and Goh, 1999; Moore 2003; Erickson, Stage, Scott and Nelson, 2006). Balsam and Brody (1983, 1985) postulated that similarities existed between reinforcement and aversive events in that the same events or processes could function as both a reinforcer and a punisher for different students. Consistent with this, Brophy (1981, p.27) pointed out that the onus was on teachers to ascertain the effectiveness of praise on different students, effectiveness could not be assumed. This tenet is central to functional behaviour analysis. The failure to assess the effectiveness of praise in respect to 'reinforcer effectiveness' and assuming equivalence (i.e., implicitly praise is a reinforcer), and ignoring the wider social context (Carr, 1994), has resulted in a bleak picture being painted of the teaching profession. The focus of functional analyses is on problem behaviour, generally of single subject design (dyadic or behaviour environment contingencies) and generalised to a setting in which considerable student behaviour is rule governed (Taylor et al., 1993). Often wanted or unwanted behaviour occurs where neither praise nor reprimands contingent or contiguous with it have a reliable effect in the expected direction, or at all (Fisher, Ninness, Piazza & Owen-DeSchryver, 1996).

Hester et al. (2009) outlined what they saw as critical factors for the effective use of praise, these being similar to the principles described for effective

reprimand (punishment, Spradlin, 2002) which reflect Skinner's (1958) finding as to the importance of the temporal relationship between behaviour and reinforcement. These included: contingency, immediacy, consistency, effect on the behaviour, proximity and specificity.

Carr, (1994) saw the examination of other functional properties of problem behaviour and the influence of context, all behaviour occurs within a social context, as important considerations in establishing descriptive analytic procedures that were consistent with results obtained from functional analysis.

The Classroom Context

Early descriptive analyses of classroom behaviour have focussed on the rates of positive and negative teacher attention in general and behaviour specific praise succeeding academic and social behaviour. More recently this research focus has included opportunities to respond (OTR), that is, increasing the rate at which students are given the opportunity to respond to academic requests, and this with in regular and special education classes, and with students displaying aggressive behaviour and emotional and behaviour disorders (EBD.) Surprisingly little research has been done on the functional relation between the most pervasive behaviour within the classroom, teacher task talk and student on-task behaviour. This is also the case for teacher social or conversational talk with students and teacher behaviour talk or talk about conduct which is often an integral aspect of reprimand, adjunct to, or an alternative to reprimand

The following discussion reviews results from predominantly descriptive analyses within the classroom setting relating to teacher approval and disapproval, opportunities to respond (OTR), reciprocal teacher-child effects, aversive stimuli in the classroom and results concerning the effectiveness of reprimands.

Overall Rates of Approval and Disapproval in General Education Classrooms

Heller and White (1975) found teacher approval rates of 0.40/min for mathematics and 0.64/min. for social studies. Disapproval was more common in lower ability classes. White (1975) found teacher verbal approval rates dropped over grades, with a marked drop after second grade. In every grade thereafter, the rate of teacher disapproval was greater than the rate of teacher approval (rates of approval ranged from 1.3 to 0.06/min; disapproval from 0.17 to 0.89/min.). Approval for social behaviour was reportedly almost non-existent.

Russell and Lin (1977) included non-verbal behaviour in their study and a 'worst' and 'best' behaved group. Fifteen percent of teacher time was spent responding to inappropriate behaviour of the 'worst' behaved group, two percent to the 'best' behaved group's inappropriate behaviour. They also found that the teacher responded proportionately more to the appropriate behaviour of the 'worst' behaved group (16% to 3%).

Thomas, Presland, Grant and Glynn (1978) found year 7 children received disapproval statements at almost three times the rate of approval statements (approval rates of 0.2/min; and disapproval rates of 0.58/min.). Gable, Hendrickson, Young, Shores and Stowitschek (1983) found praise rates in classes of children with learning disabilities to range from 0.07 – 0.16/min. and a ratio of reprimands to praise of 2:1. More than 20% of time involved negative teacher/student interactions. Teacher/student positive interactions constituted less than 5% of time. The level of positive and negative feedback and repeated commands to students was low (0.1 probability of positive consequences; 0.14 probability of negative consequences). Considerable positive feedback was found to be contingent on non-compliance. Low rated children received positive feedback after non-compliance (0.14 probability) more than following compliance to a command. They were similarly six times as likely to receive repeated commands following compliance than were high rated students. The findings of Strain, Lambert, Kerr, Stagg and Lenkner (1983) are consistent with those of White (1975); Heller and White (1975); Thomas, Presland, Grant and Glynn (1978) and Gable,

Hendrickson, Young, Shores and Sowitschek, (1983) in that they found more teacher negative feedback than positive.

Nafpaktitis, Mayer and Butterworth (1985) in assessing natural rates of teacher approval and disapproval found a positive significant correlation between the rate of disapproval and the rate of off-task behaviour by students. The mean rate of disapproval was 0.29/min., appropriate approval 0.9/min. Inappropriate approval by teachers was significant, 0.4/min., accounting for 25% of the variance of disruptive student behaviour (p. 365). Merrett and Wheldall (1987) found rates of approval **(**1.15/min.) overall to be greater than disapproval (0.93/min.). Most approval was directed towards academic behaviour. Positive responses for academic behaviour were three times as frequent as negative responses. For social behaviour negative responses were five times as frequent as positive responses. Wheldall, Houghton and Merrett (1989) found that teachers approved more than they disapproved and that most approval responses were academically directed. For academic behaviour there were three times as many positive responses than negative, the reverse was the case for social behaviour. Mean approval rates/min. of 0.65 were found in Secondary School, 1.15 in Primary/middle school settings. Disapproval rates were 0.93/min. in Primary/middle school and 0.53/min. in Secondary School. Both approval and disapproval rates were higher in the junior classes. Winter (1990) similarly found teachers approved more than they disapproved and that approval was more directed to academic rather than social behaviour. Wheldall and Beaman (1994) reported a mean approval rate 0.45/min. and disapproval rate of 0.40/min. in the Secondary School setting. Overall approval was slightly greater than disapproval. Approval was eight times as frequent for academic behaviour than social behaviour, disapproval for social behaviour was six times more frequent than positive responses for such behaviour.

Early descriptive analyses indicated teacher reprimand to be greater than teacher approval, approval being more directed to academic behaviour than social behaviour, disapproval more so to social behaviour. Teacher approval ranged from 0.20 to 1.15 events per minute, disapproval 0.17 to 0.93 events per minute. Latter analyses indicated greater rates of teacher approval than disapproval although the rates remained similar to those from the earlier studies. Wheldall, Houghton and

Merrett (1989) found approval and disapproval rates to be higher in the junior classes.

Correlational studies have generally shown positive correlations between teacher approval (praise) and student on-task behaviour (albeit they are usually too low to be considered significant (Owen, Slep & Heyman, (2012), and negative correlations between teacher disapproval (reprimand) and student on-task behaviour (Thomas, et al., 1978; Nafpaktitis, et al., 1985; Wheldall, et al., 1989; Winter, 1990; Gable, et al., 2009).

Opportunities to Respond (OTR)

A similar trend, that of isolating factors from functional analyses and subsequently assaying their occurrence in the natural setting has been found with descriptive analyses of OTR. Increasing the rate at which students are given the opportunity to respond to academic requests (OTR) improved performance and on-task behaviour (Carnine, 1976) and decreased disruptive behaviour (Carnine, 1976; West & Sloane, 1986; Skinner & Shapiro, 1989). Van Acker, Grant, and Henry (1996), assessing teacher and student behaviour as a function of risk for aggression, found rates of 0.025/min. for OTR and praise rates of 1.4/hr (0.02/min.) for the 'mid risk for aggression' group and an OTR rate of 0.02/min. and a praise rate of 1.2/hr (0.02/min.) for the 'high risk' group. Reprimand rates were twice the praise rate for the 'mid risk' group and four times that for the 'high risk' group. Correct academic responses predicted teacher praise in the 'mid risk' group, however neither this nor compliance predicted praise for the 'high risk' group. Wehby et al. (1995) found 1.6/hour (0.03/min.) praise statements for low aggressors, 2.8/hour (0.05/min.) for high aggressors and OTR from 0.156/min. to 0.163 respectively Sutherland, Wehby and Yoder (2002) found praise rates of 0.646/min; OTR 1.566/min; reprimands 0.399/min; academic talk 3.974/min. Most interactions were instructional sequences. Scott and associates (2011) found praise to an individual student occurred at a rate of 0.06/ min., OTRs directed toward a group at 0.49/min., and toward an individual 0.08/ min. The schools in this study were all characterized by poverty – teachers spent 37.8 percent of available time in non-teaching activity.

The above results indicate a range of OTR of 0.02 to 1.57/minute. Both rates of praise and OTR are of lower rate for students with behaviour problems and reprimands higher. Like rates of praise, reported rates of OTR are not substantial.

The similarity between reported rates of praise and OTR has led Gunter and associates (1993) to suggest that a relationship exists between these. This is understandable as creating additional opportunities to respond for the student creates an equal number of discrete opportunities for teacher response. This also indicates a greater rate of instruction (task talk) by the teacher, be it individual or group targeted.

Praise or behaviour specific praise (and OTR which provides greater opportunities for praise) may be effective at increasing student on-task behaviour because of the increase in teacher task related attention, not the specific qualitative nature of the subsequent event itself. The inclusion of 'attending to teacher' as an integral part of the measure of student on-task behaviour is a confounding aspect in these results.

Teacher Approval and Disapproval for Students with Problem Behaviour

The previously mentioned focus of descriptive analyses on the failure of teachers to implement known effective functional analysis strategy (Beaman & Wheldall, 2000) prescribes many of the findings from descriptive analyses within classrooms, and the reported discrepant treatment of 'problem children' relative to 'normal children'.

Numerous researchers have found teacher behaviour to be discriminative and avoidant of student problem behaviour (Carnine, 1976; Wehby et al., 1995; Sutherland et al., 2002). Gunter, Ellis, De Briere and Wehby (1993) looking at both regular and special education classes found praise rates in the former to be 1.2/hr, and for special education classes 4.5/hr. Praise for compliance constituted 2% of the total time. In classes of children with emotional and behavioural disorders (EBD), Shores, Jack, Gunter, Ellis, De Briere and Wehby (1993) recorded praise

statements of 1/hr. Students with aggressive histories received 6–20 times more negative consequences from teachers than non-EBD or non-aggressive EBDs. In similar classes, Wehby, Symons and Shores, (1995) found praise rates of between 0.02 and 0.04 per hour. Shores (1993) found that negative interactions constituted 22% of the observed time, neutral interactions 11%, and positive interactions 3%. Jack, Shores, Denny, Gunter, DeBriere and DePaepe (1996) found that more than 20% of time was constituted of negative teacher/student interactions. Positive interactions constituted less than 5% of the time.

The described rates for praise (0.2 to 1.15/min.) and disapproval (0.17 to 0.93/min.) in general classes are not substantial. This paucity of praise and greater rate of reprimand within classrooms particularly for social behaviour has remained largely a consistent finding of classroom descriptive analyses over time. This has often been more pronounced for those children with behaviour problems and this has led to additional study into opportunities to respond to academic requests (OTR), reciprocal (teacher/child) effects and the aversiveness of the classroom setting. In the absence of information concerning the rates of behaviour to which these studies refer, on-task and unwanted behaviour, the meaningfulness of the data is reduced, aside from limited descriptive comparison with previous correlational or functional analysis studies. The results proffer no indication of the way in which teacher negative behaviour or lesser rates of positive or academic attention impacted on-task or problem behaviour.

For example, Van Acker, Grant and Henry (1996) found the most predictable sequence of teacher–student interactions occurred during episodes of teacher reprimands for inappropriate behaviour for students at risk for emotional and behavioural disorders (EBD). Nelson and Roberts (2000) found teachers "were more likely to respond negatively to the disruptive behaviour of target students than to those of criterion (other) students" (p.27). Carr, Taylor and Robinson (1991) found that:

> Adults engaged in teaching activities with non-problem children more often than with problem children … when an adult worked with a problem child the breadth of instruction was more limited (fewer task demands were

> presented) and typically involved those tasks associated with lower rates of problem behaviour. … Students learned that demonstrating undesirable behaviours allow them to avoid instruction (escape behaviour). p. 523

Carr et al. (1991) and Taylor and Carr (1992b) found escape behaviour reduced task demands, attention-seeking behaviour increased adult attention, and "socially avoidant problem behavior decreased adult attention." (p. 73).

Gunter and Countinho (1997) found that the more aggressive students received fewer academic directives. Similar conclusions have been drawn by Shores and Wehby (1999), Gunter and associates (1993 and 1994), Gunter and Countinho (1997). This is unsurprising given the findings of Strain and Ezzell (1978), who observed physical aggression often began with a teacher telling a child to do something, the child not complying, and the situation escalating. Similar findings were presented by Wehby, Symons and Shores (1995) with respect to aggressive behaviour directed towards teachers.

Little and Hudson (1998) indicated teacher avoidance of problem students to have a more generalised effect, including on the teacher. "Child misbehaviour in the classroom results in decreased opportunities to learn for the individual and his peers… and also causes high levels of professional stress and personal distress in teachers" (p.214).

Attribution of Cause for Student Problem Behaviour

Shores, Gunter, Denny and Jack (1993); Gunter, Denny, Jack, Shores and Nelson (1993) and Shores, Gunter, and Jack (1993) have suggested that many of the problems experienced with students with emotional and behavioural disorders (EBD) to be a function of the aversiveness of the school setting. Further investigation has shown such aversive factors to include task difficulty (Weeks and Gaylord-Ross, 1981; Vaughn and Horner, 1997; McComas, Hoch, Paone and El-Roy, 2000; Lannie and Martens, 2004), preference for tasks, pacing of demands, repetition of tasks and the influence of attention (Michael, 2000). The relevance of

task difficulty as an aversive factor is supported by the cumulative nature of learning, the acquisition of one step being prerequisite learning for the next. Collectively the presentation of these views has broadened the approaches adopted to overcome these difficulties, many of which can be seen as reversing the teaching relationship such that student behaviour ('aversion for …') is defining the teaching process. Further, such views distract the focus from perhaps more fundamental and salient factors, for example the Scott et al. (2011) finding that in four schools characterised by poverty teachers were not engaged in teaching students 37.8% of the time. This finding was of considerable concern to them. Greater appraisal of the classroom social context is necessary to make many of the described research findings 'meaningful,' and additionally, adopting a specific focus on maximising on-task behaviour in order to progress knowledge in this area.

Reprimands

Van Houten and Doleys (1983) attributed the lack of systematic research into reprimands as an effective management technique to the studies by Madsen, Becker, Thomas, Koser and Plager (1968) and Thomas, Becker and Armstrong (1968). These studies have been seen as seminal and have over time resulted in numerous descriptive analyses of classroom behaviour looking at the rates of occurrence of these behaviours (praise and reprimands) from the perspective of praise being basic and reprimands deleterious to performance. These sentiments have been restated by others and with increasing negative weighting, for example:

Nafpaktitis, Mayer and Butterworth, (1985, p.367) stated that "many studies have shown reprimands to be a characteristic response of teachers to social problem behaviour and "the frequent use of disapproval and inappropriate approval are not effective management strategies." Van Acker, Grant & Henry (1996) stated that:

> Reprimand appears to exacerbate student negative behaviour and non compliance for those students at the greatest risk for aggressive behaviour … praise cannot be predicted to follow any specified high-risk student

> behaviour above chance levels. Reprimand, however, is a predictable behaviour. (p. 331)

Similar conclusions have been drawn by Strain et al, (1983), Wehby, Symons, and Shores (1995) and Wehby**,** Symons and Canale (1998). Redd, Morris and Martin (1975, p. 153) found that adults who delivered reprimands were much less preferred by the children than the adults who delivered praise or remained neutral. They concluded that "excessive over-reliance on punishment can lead to a breakdown in social harmony that could easily lead to escape behavior." Martin (1977) found that tasks associated with reprimands were never chosen by children in free time, always those paired with praise.

Gunter and associates (1993, 1994) described teacher interactions with problem children as constituting a 'cycle of negative reinforcement,' wherein a response or behaviour is strengthened by stopping, removing or avoiding a negative outcome or aversive stimulus, and that this 'cycle' related equally to both teacher and student avoidance of issuing and avoiding task demands.

This lack of approval for social behaviour led Shores, Jack, Gunter, Ellis, DeBriere and Wehby (1993) to suggest that student "compliance (generally) may have been under the control of negative reinforcement contingencies." (p.27). That is, students mostly comply to avoid teacher disapproval or other negative consequences.

Beaman and Wheldall (2000), summarising descriptive analyses into teachers' use of approval and disapproval in the classroom, concluded, "There is little evidence to suggest that teachers, universally, systematically deploy contingent praise as positive reinforcement in spite of the considerable literature testifying to its effectiveness. In particular, praise for appropriate classroom social behaviour is only rarely observed." (p. 431).

The foregoing review proffers a disturbing picture of the teaching profession and its apparent reluctance to accept and adopt research-based findings into the classroom.

The findings of Ndoro, Hanley, Tiger and Heals (2006) indicating rates of compliance were far higher than rates of non-compliance and problem behaviour in the classroom offer some balance to this.

Some writers have suggested reasons as to why there is such a paucity of praise, particularly for social behaviour, within classrooms. Brophy (1981) described feedback to students about academic performance and conduct within classrooms as essential, however saw praise as unnecessary and sometimes intrusive. "… much teacher praise is reactive to and under the control of student behavior rather than vice versa" (Brophy, 1981, p.5).

As described above, the available research makes it appear that teachers are ignoring the wealth of literature on the efficacy of praise and deleterious effects of reprimands in the classroom setting. However, it is unlikely that a profession would ignore research that has shown teacher approval (praise) to relate significantly with student on-task behaviour, and teacher reprimand or disapproval to relate negatively with student on-task behaviour – to ignore what has been repeatedly shown to be an effective intervention in functional analysis studies – unless such effects are not readily replicated in the classroom setting by them or that other factors override implementation – such as the potential effectiveness of reprimand in the reduction or cessation of student unwanted behaviour.

Madsen, Becker, Thomas, Koser and Plager (1972) reported a reluctance for teachers to ignore inappropriate behaviour, a view shared and endorsed by Swinson and Harrop (2001), who saw this as potentially enhancing the risk of contagion.

The public nature of classrooms (and home and institution) the visibility this embodies, is such that reinforcement (Kazdin, 1966) and reprimands (Van Houten, Nau, Mackenzie-Keating, Sameoto and Colavecchia, 1982) have a generalised effect, and teacher (parent or caregiver) to student (Shores, Gunter and Jack, 1992) or child (Forehand et al., 1987) proximity have an overriding, generally moderating, effect on child or student behaviour.

Reprimand Effectiveness

Reprimands have been shown to have an immediate suppressant effect on problem behaviour, albeit temporary (Nafpaktitis et al., 1985; Jack, Shores, et al., 1993; Sloman et al., 2005) This effect has been seen by some writers as reinforcing the continued and escalating use of these strategies (Van Houten, Nau, McKenzie-Keating, Sameoto and Colavecchia, (1982).

Despite the negative connotations accorded reprimands, numerous studies have successfully combined praise for appropriate behaviour with reprimands for inappropriate behaviour (for example McAllister et al., 1969). "Punishment (reprimand) will produce a greater reduction in response rate if an unpunished alternate response is available … and if that response is reinforced on a schedule equal to or greater than reinforcement for the punished response." (Spradlin, 2002, p. 475; Azrin & Holz, 1966; Kazdin, 1966; Fisher et al., 1994).

The effectiveness of reprimands compared with distraction has also been examined, with outcomes suggesting reprimands are more effective. Within parent/child relationships, Minton and associates (1971) found that reprimands were the most common responses to child misbehaviour whereas Schaffer and Crook (1978) found that mothers used distraction much more frequently than reprimands. The Schaffer and Crook study used a sample of younger children and the difference may be an artefact of this, similar to the age differentiated results found by White (1975) and Wheldall, Houghton and Merrett (1989) in respect to rates of praise and reprimands. Kaczynski, Kochanska, Radke-Yarrow and Girnius-Brown (1987) found children tend to be more resistant when mothers use distraction than when they use reprimands. Negative affect ('umbrage and outcry') was highest when reprimands followed distraction. Reprimands were more effective than distractions. Distraction was more effective following than preceding a period of reprimand use. Similar findings have been presented by Reid, O'Leary and Wolff (1994). Moore and Bailey (1973) found in their study that the increased use of reprimands for inappropriate behaviour was the key factor associated with the child's improvement.

Many studies have found reprimands to be effective in the classroom setting: O'Leary and Becker (1969); Hall, Axelrod, Foundopoulos, Shellmann, Campbell and Cranston (1971); Sloman, Vollmer, Cotnoir, Borrero, Borrero, Samaha and St. Peter (2005); four studies by Rosen, O'Leary, Joyce, Conway and Pfiffner (1984); O'Leary and Becker, (1968); O'Leary, Kaufman, Kass and Drabman, (1970); Van Houten, et al., (1982).

Acker and O'Leary (1987) showed reprimands alone were associated with high levels of on-task behaviour. The addition of praise produced no change:

> The withdrawal of all consequences caused significant decreases in on-task behaviour and academic productivity. The subsequent use of praise alone led to an initial increase followed by a dramatic decline in on-task performance, resulting in no change in the average rate of on-task behaviour relative to the use of no consequences. (p. 549).

Redd, Morris and Martin (1975) compared the effects of reprimand and praise. The use of reprimands for off-task performance led to the highest level of on-task performance. Forehand, Roberts, Doleys, Hobbs and Resick (1976) showed that reprimand was superior to both contingent isolation and contingent ignore conditions reducing non-compliance and off-task behaviour. Verbal reprimands reduced non-compliance repeated commands did not. The reprimand condition was associated with less off-task behaviour. Martin (1977) found verbal reprimands resulted in task rates higher than praise alone, the latter being only slightly higher than no interaction.

Variables in the way in which reprimands are delivered such as proximity and eye contact, volume, continuous vs intermittent reprimands, and combinations of different behaviour talk have been shown to affect how successful reprimands are in increasing compliance and on-task behaviour, and reducing disruptive behaviour. Findings from studies of these variables are outlined below.

Reprimands were found to be more effective when they were delivered in close proximity than when they were delivered at a greater distance (Pfiffner,

O'Leary, Rosen and Sanderson, 1985; Van Houten, Nau, Mackenzie-Keating, Sameoto and Colavecchia, 1982). Higher frequencies of reprimand delivery were associated with lower frequencies of disruptive behaviour, and they are most effective when they consistently follow each instance of an unwanted behaviour.

Considering the effects of continuous and intermittent verbal reprimands and response cost (loss of recess time) on the off-task classroom behaviours of children with behaviour problems, Van Houten, Nau, Mackenzie-Keating, Sameoto and Colavecchia (1982), found that all four interventions significantly decreased off-task behaviour compared to a no-treatment baseline. Response cost was the most effective, the others were less effective and equivalent in effect to each other.

Hall, Axelrod, Foundopoulos, Shellman, Campbell and Cranston (1971) found that the intensity of the reprimand enhanced effectiveness. Similarly, loud reprimands have been shown to be more effective than soft reprimands (Doleys, Wells, Hobbs, Roberts & Cartelli, 1976; Doleys, Baker and Brisset**,** 1979; MacAllister, Stachowial, Baer and Conderman, 1969; Risley, 1968). Van Houten, Nau, McKenzie-Keating, Sameoto and Colavecchia (1982) showed that verbal reprimands delivered with eye-contact and firm grasp of the student reduced disruptive behaviour more than did verbal reprimands delivered without eye contact and grasp; that proximity increased effectiveness and that the suppression effect generalised to both members of a pair, that is, it generalised to proximal non-reprimanded others.

Contrarily, O'Leary and Becker (1969) reported that soft reprimands were marginally more effective than loud reprimands in a classroom setting. Workman and Williams (1980) found that a praise/soft reprimand condition effected more rapid and slightly greater change in behaviour than a praise/ignore condition and both conditions were "substantially superior to the baseline or reversal conditions" (p.378), albeit, the change reversed less rapidly in the praise/ignore combination. Houghton, Wheldall, Jukes and Sharpe (1990) showed minimal use of private reprimands and use of private praise statements were effective in increasing the on-task behaviour of Secondary aged pupils in all classes by an average of over 20%. These reported effects are however not differentiable from the effects of increased teacher proximity.

Rosen, O'Leary, Joyce, Conway and Pfiffner (1984) found that when some level of mild negative consequence was maintained, the withdrawal of positive consequences produced no change in rates of appropriate classroom behaviour**.** Jones and Miller (1974) also reported that the number of reprimands required to maintain order declined as the school year progressed. Both these studies show that reprimands can have a generalised effect over time. Reprimands of two words and less are associated with lower rates of off-task behaviour than those constituted of two or more phrases when the frequency of praise and reprimand is controlled (Abromowitz, O'Leary and Futtersak, 1988).

Redd, Morris and Martin (1975) found that the use of reprimands for off-task performance led to the highest level of performance. Acker and O'Leary (1987) showed that reprimands alone can be as effective in increasing on-task behaviour as the use of a combination of reprimands and praise.

A high level of reprimand (80%) is more effective than a lower level (20%) in reducing inappropriate behaviour when attention is paid to other instances of the inappropriate behaviour, but this does not occur when other instances of inappropriate behaviour are ignored (Sherrill, O'Leary, Alberton-Kelly & Kendziora, 1996). They concluded that "attending to a misbehaviour is a serious mistake when few misbehaviours are reprimanded" (p.234). Further, they stated that "effective discipline had positive rather than negative side effects" (p.233).

Much of the research identifying parameters of reprimand effectiveness reflect identified research-based principles of punishment (Lerman & Vorndran 2002, pp. 438-446; Spradlin, 2002, p. 476). These principles are outlined below:

- "The greater the magnitude (intensity) of the punisher (Hall, Axelrod, Foundopoulos, Shellman, Campbell & Cranston, 1971) and the more immediate it is on the behaviour the greater suppressant effect it will have. (Cohen, 1968; Church, 1969; Deluty, 1978).
- Punishment will produce a greater reduction in response rate if it is delivered immediately than if it is presented after a delay (Spradlin, 2002).

- Sufficiently intense punishers may produce lasting reductions in problem behavior as long as the punishment contingency remains in effect. (Jones and Miller, 1974 ; Lerman & Vorndran, 2002).
- Punishment will produce a greater reduction in response rate if it is delivered on a continuous schedule; "Current knowledge about punishment schedules suggests a continuous schedule of punishment should always be implemented initially." (Sherrill, O'Leary, Alberton-Kelly & Kendziora, 1996; Lerman & Vorndran, 2002).
- Punishment will produce a greater reduction in response rate if the schedule of reinforcement for the problem behavior is decreased or eliminated rather than maintained on a rich schedule (Spradlin, 2002).
- Punishment will produce a greater reduction in response rate if an unpunished alternate response is available that is reinforced on a schedule equal to or greater than the schedule of reinforcement for the punished response than if no such alternate response is available (Azrin & Holz, 1966; Kazdin, 1966; McAllister et al., 1969; Fisher et al., 1994; and Spradlin, 2002).
- A stimulus is more likely to function as a punisher if it also serves as a signal for non-reinforcement or a decrease in reinforcement than if it signals an increase in the density of reinforcement" (Spradlin, 2002, p. 476).

Van Houten and Doleys, (1983) found that periodic reprimands enhanced the effectiveness of praise as a reinforcer and that this process was reciprocal. Further studies have looked at praise–reprimand ratios (Nafpaktitis, Mayer, & Butterworth, 1985; Wheldall, 2005; White, 2010) in trying to identify effective or optimal ratios.

Van Houten and Doleys (1983) attributed the lack of systematic research into reprimands as an effective management technique to conclusions drawn from the studies conducted by Thomas, Becker and Armstrong (1968) and Madsen, Becker, Thomas, Koser and Plager (1968) which concluded that approval for appropriate behaviour to be focal in reducing problem behaviour and increasing academic performance and that repeated commands increased the frequency of the

behaviour they were intended to stop. This belief and resultant positive programming approach presented by LaVigna and Donnellan, (1986) and LaVigna, Negri-Shoultz and Fassbender, (1988) had an impact on research into reprimand effectiveness, how it was viewed and consequently the application of this strategy.

Research has not evaluated teacher or adult behaviour talk or talk about conduct, which is frequently an integral part of the reprimand process, or an alternative to it.

1.2 Summary and Limitations to the Existing Research Base

Early descriptive analyses of classroom behaviour indicated rates of praise and reprimand to be low, with reprimand being greater than that of praise. Later studies have shown the converse, although overall rates have remained equivalent. For those students with behaviour problems lesser rates of praise, greater rates of reprimand and fewer task demands than their counterparts have been found. The principal explanation for this discrepant treatment is the reciprocal negative reinforcement paradigm of avoidance of task demands avoiding problem behaviour.

Known parameters of reprimand effectiveness parallel experimentally established punishment principles (as summarised by Lerman and Vorndran, 2002; Spradlin, 2002). Overall, there remains considerable contention as to its effectiveness. Research has over time endeavoured to identify those teacher or parent behaviours that enhance the effectiveness of reprimands, such as proximity, intensity and praise–reprimand ratios (Strain and associates, 1983; Nafpaktitis, Mayer and Butterworth, 1985; Wehby, Symons, and Shores, 1995, and Wehby**,** Symons and Canale, 1998). Reprimands have been shown to have an immediate suppressant effect on problem behaviour, albeit a temporary one (Nafpaktitis et al., 1985; Jack, Shores, et al., 1993; Sloman et al., 2005). This effect has been described by some writers as reinforcing the continued and increasing use of these (‘ineffective’) strategies (Van Houten, Nau, McKenzie-Keating, Sameoto and Colavecchia, (1982).

Redd, Morris and Martin (1975) found that adults who delivered reprimands were much less preferred by the children. Research has not evaluated teacher or adult behaviour talk or talk about conduct which is frequently an integral part of reprimand, or an alternative to it.

Praise, in contrast, has been shown in many studies to enhance student on-task behaviour, more so if the praise is task specific (Sutherland, Wehby & Copeland, 2000). Other studies have found strong correlations between praise and student on-task behaviour (Gable et al., 2009). In combination with opportunities to respond (OTRs) praise has been shown to enhance student on-task behaviour (Gunter and associates, 1993) and to both increase on-task behaviour and increase students' enjoyment of activities (Chalk and Bizo, 2004). There remains some contention about these points, some writers suggesting the differences in outcome to be attributable to samples being clinical or non-clinical in nature (Bailey, 2006). Further studies have looked at shaping praise as a reinforcer in analogue settings and generalising this relationship to the classroom setting (Thompson and Iwata, 2007).

Cantrell, Stenner and Katzenmayer (1977) stated that high rates of praise and opportunities to respond (OTR) are associated with 'positive contingency managers.' Similarly, Espin and Yell (1994) found that preservice teachers rated as most effective had the highest rates of opportunities to respond (OTRs) and praise.

"The failure to assess the effectiveness of praise in respect to 'reinforcer effectiveness' and assuming equivalence (i.e., implicitly praise is a reinforcer) and context," (Brophy, 1981, p.4) is reflected in the perception of reprimands as ineffective 'punishers' that often serve to exacerbate problem behaviour (Van Acker, Grant & Henry, 1996). Within the home setting there exists a body of research clearly indicating reprimand to be effective at suppressing child inappropriate behaviour and in retaining appropriate functioning. As Vollmer (2002) points out, "Punishment happens." p.469

The low rates of praise, task specific praise, opportunities to respond relative to reprimand found within classroom settings question the notion that individual

specific contingencies are of sufficient occurrence (rate) to contain student unwanted behaviour and maintain on-task behaviour. The predominant student behaviour in the classroom is on-task behaviour, levels of compliance are far higher than levels of non-compliance and problem behaviour. (Ndoro et al., 2006).

Galizio (1979), Hayes, Brownstein and Kern (1986), Hackenberg and Joher (1994), Schmitt (1998), and Fantino and Romanowich (2006) have suggested that instructional control or compliance with instruction to be more than a function of the relationship between the instruction and the contingencies. Fantino, (2004, p. 281) sees most student behaviour within the classroom as rule-governed and this "rule governed (that is, instructed) behaviour is often less sensitive to changes in environmental contingencies than is contingency-shaped behaviour". Carr (1994) suggested a greater focus on the social context in which behaviour occurred to be necessary in ascertaining other functional relations.

Classrooms are 'noisy' environments with many distractions potentially competing with learning. The student's default (or desired) position is unlikely to be on-task behaviour, or other instruction following behaviour, rather social interaction with peers or other competing pursuit. Pervasive teacher task related verbal behaviour talk that is public in nature, is a basic contextual factor in retaining an ongoing student task related focus in this setting.

Descriptive analyses of classroom behaviour have shown that most teacher child interactions are, "neutral … not intended to directly control or manage behavior" (O'Leary & Sanderson, 1990, p. 257), are instructional sequences or academic talk (Galton, Simon, & Croll, 1980; Shores & Jack, 1993; Shores, Jack et al., 1993; Wehby, Symons & Shores, 1995; Wehby and Yoder, 2002). Within the class setting:

> Teacher talk is not only dominant, but also regulatory… Teachers in the classrooms we studied do most of the talking. Their talk is most often directed at the entire class and less frequently at individual members of the class. … Students' verbal behavior is much more limited than that of

> teachers. They are basically responders rather than initiators. (Bellack & Kleibard, 1966, p.6).

They found a ratio of teacher talk to learner talk of 3:1. The TIMSS-R video study (1998–2004), looking at grade 8 mathematics classes across seven countries found that teachers, adjudged 'to be competent teachers in their respective countries,' talked at a ratio of at least 8:1 words compared with students. Galton, Simon and Croll (1980) reported 22% of teacher talk was neutral or was feedback on performance. These results indicate that teacher verbal behaviour within the classroom is predominantly 'instructional sequences or academic talk,' task talk and is the most common teacher verbal behaviour. By its very nature, it is defining of student attention and application to task. The predominant student behaviour within the classroom is on-task behaviour. The functional nature of this behaviour has not been fully appraised. This is similarly the case for teacher social or conversational talk and teacher talk about conduct or behaviour.

The research findings for both praise and reprimand in the classroom setting as whole of class strategy remain equivocal and questionably practicable (Mace, 1990). Perhaps the defining statement in this regard is the lack of adoption of the research findings derived from individual functional analyses, indicating praise to be fundamental in respect to maintaining wanted behaviour and reducing unwanted behaviour, and reprimand having a deleterious effect on on-task behaviour in the classroom.

It is questionable if functional analysis studies have isolated the actual variables maintaining problem behaviour in a whole of class setting, or simply those variables sufficient in effecting change for individual students. For example, further differentiation of variables may indicate teacher task talk to be more effective at maintaining desired behaviour than praise, or task or behaviour specific praise, in that this is less likely to inherently embody a distraction from task effect. The utility of these strategies as general whole of class teaching strategies must ultimately be adjudged by how practicably generalizable they are to a whole of class setting and the extent to which they are adopted by teachers and effectively used.

Praise, opportunities to respond and reprimands are a function of the rate of teacher task talk, in so far as the greater the rate and duration of task talk, the greater the opportunities for praise and OTR and the greater the occurrence of both and the lesser the need for and occurrence of reprimands.

Atwater and Morris, (1988) found that children were more likely to comply with an instruction if they were engaged in an activity than if they were off task or disruptive. Similarly, Fisher et al. (1997) found the effectiveness of verbal attention to be dependent on its content or task relevance.

The natural rates of teacher verbal behaviour and the rates of interaction or behaviour that is accessible to an individual student (public) and is consistent or congruent with desired functioning define and maintain the demand characteristics and appropriate student functioning. This includes the retention of teacher or parent as focal and maintaining instructional control. Individual contingencies, response-consequence relations or individual contingencies are secondary to these.

Social consequences, praise and reprimand, are meaningful descriptors only when viewed in relation to the rate and duration of the referent behaviour, the behaviour to which it relates (rates of on-task behaviour and unwanted behaviour). For example, praise for academic or on-task behaviour is viewed relative to the predominant student activity within class, student on-task behaviour (Ndoro et al., 2006). This indicates the consistency and contingency of the behaviour-subsequent event relation and hence potential effectiveness - both praise and reprimand will produce a greater reduction in response rate if delivered on a continuous schedule; (Lerman & Vorndran, 2002; Hester et al., 2009).

Reprimand is viewed relative to a behaviour of considerably lesser occurrence and as such is more visible and discretely addressable than is on-task behaviour. The overall social context is salient in defining common and hence individual behaviour, individual contingencies being secondary to these.

In the writer's experience (in excess of forty years providing advice and interventions for individuals, across home, school and institutional settings), the maintenance of attention, application to task and instructional control are a function

of the rate of teacher (parent) task talk. This defines the context in which praise and reprimands gain their effect. It maximises the contrast between punished and non-punished events in that it enables an ongoing positive relationship and increases the effect of punishment (MacMillan et al., 1973). In addition, this enables distractibility, off-task and inappropriate behaviour to be better addressed by task or work-related redirection as opposed to addressing problem behaviour directly. Reprimands mainly result in the immediate suppression of unwanted behaviour, albeit temporarily. To be effective, punishment should be immediate on the behaviour and stop when the behaviour stops (Lerman & Vorndran, 2002). Any ongoing positive effect from such intervention is dependent on the immediacy of redirection to work, directing task related attention to the on-task behaviour of others (reducing the public nature of the intervention), and all within the period in which the unwanted behaviour is attenuated, i.e., the teacher continuing to proactively define the situation as task related.

Research into classroom behaviour has resulted in a considerable problem-focussed body of knowledge rather than a focus on what behaviour maximises application to task and learning and concomitantly minimises off-task and problem behaviour.

If teacher (adult) talk is task or activity specific and this focus is frequent, ongoing, and public, this defines the situation, behavioural expectation and performance. It defines the social context of the learning environment … 'if you focus on what you want, you are more likely to get it.' A rate of teacher task talk that has resulted in diminishing returns has not been observed.

1.3 Methods of Analysis for Determining Behaviour – Subsequent Event Relations

Descriptive analyses have frequently been used to identify environment behaviour relations on the assumption that naturally occurring consequences indicate functional relations. This despite poor correspondence with functional analysis (Thompson & Iwata, 2007).

Functional analyses (single subject design) requires the identification of immediate antecedents and consequences, it relies on discrete momentary events and contiguity between them (Baum 2003).

Difficulties in the identification of immediate antecedents and consequences have often been discussed in the literature (Carr 1997; Kennedy & Dunlap, 2000). They are seldom momentary or discrete, (Baum, 2003).

This situation led (Carr, 2000) to introduce analogue ('contrived') functional analyses in which relationships are examined in an experimental situation (removing context) in order to enable greater experimental control. This procedure however may result in antecedents and/or consequences being identified that are not effective in changing behaviour in the natural situation being found, or that may not be readily implemented by a classroom teacher.

Students need to be under teacher instructional control not that of an experimenter or teacher aide and any interventions or strategies must be readily implemented by them, must not overly impede general classroom instruction and must be effective, that is, they must be practicable and work.

These difficulties have resulted in endeavours to identify optimal rates of social consequences (Jenkins et al., 2015) more specific or idiosyncratic antecedents and consequences (Carr et al., 1997), whilst retaining a molecular focus (Baum, 2003) rather than assaying the broader social (and temporal) context.

Molar Analyses: Continuous duration records enable a focus on time spent in an activity, on extended patterns of behaviour and correlations (behaviour-subsequent event relations over time) rather than response rate (Baum, 2003). This allows for lagging the independent variable relative to dependent variables to better reflect the subsequent (and/or protracted) nature of the independent variable, such as praise and reprimand, and the changing relationships over time.

1.4 Rationale for the Current Study

Research has not evaluated teacher 'task talk' in any but a cursory descriptive manner (most teacher talk was 'neutral' (Shores, 1993), or was

'feedback on performance,' (Galton, Simon & Croll, 1980); or 'were instructional sequences,' (Gunter, Shores, Rasmussen & Flowers, 1993; Shores, Gunter & Jack, 1993), 'academic or social requests' (Wehby, Symons & Shores, 1995), not in respect to function. The frequency and dispersion (rate) and duration of task talk could be said to be prescriptive in defining the setting event, reinforcement context, teaching relationship and reinforcement for academic performance – providing discriminative stimuli for the maintenance of attention and academic performance – and co-requisite in maintaining this. The greater the rate of task talk, the greater levels of performance and lesser levels of competing behaviour will be realised, and that this will be particularly apparent in respect of those children with poor social skills and pre-existing behaviour problems. Additionally, teacher social or conversational talk and teacher talk about conduct or behaviour has received no or minimal attention in the literature. The focus has largely been on teacher approval (praise) and disapproval (reprimand). Essentially, the only available means teachers have to effectively manage a class is their verbal behaviour and proximity to a student.

There is a lack of research regarding many of the dimensions (independent and dependent variables and the target of those independent variables) relating to the classroom setting (or any settings), that are examined in the current study.

Praise has not been analysed in respect to the ratio with referent behavior or research-based principles (Hester et al., 2009; Jenkins et al, 2015).
No studies have looked at the extent to which known research-based punishment principles are applied within the classroom.
Research has not evaluated teacher behaviour talk or talk about conduct which is frequently an integral part of reprimand, an adjunct to, or an alternative to it.
Research has only minimally evaluated teacher social talk despite it being 'intuitively associated' with improving teacher-student relationships (Bishop et al, 2003; Allday & Pakurar, 2007).

Teacher task talk is an unstudied aspect of classroom behaviour which is surprising as it constitutes the principal teacher verbal behaviour in the classroom, (Galton, Simon, & Croll, 1980; Shores, 1993; Shores, Jack et al., 1993; Wehby, Symons & Shores, 1995; Wehby & Yoder, 2002).

This dearth of information means there are no 'gold standard' measures available with which to examine or compare information. This has necessarily resulted in the examination of a large number of variables so that the classroom social context is comprehensively measured and relationships between independent and dependent variables clarified in a meaningful manner. The consequence of this is the overall length of the study.

1.5 Purpose of the Current Study

The purpose of the present study is to use descriptive analysis to look at the relationship of rates of teacher verbal behaviour (task talk, social talk, reprimand and behaviour talk, and praise), and teacher proximity to an individual student (the independent variable) in maintaining appropriate task and social performance (the dependent variable) in respect to a target student in classroom settings. The recorded behaviour could be differentiated by target and analysed separately or combined. For example, teacher task talk to the whole class, to the target student and to other students, severally and combined. Rates of teacher verbal behaviour (the independent variable) were correlated with student on-task behaviour and unwanted behaviour (the dependent variable).

Recording behaviour continuously enabled the presentation of data graphically such that variations in rate were visible across time and the correspondence with correlations more descriptive and explanatory. This allowed for the correlation of the independent variables (e.g. praise and reprimand) at different times (cross correlations) such that correlations could be calculated for data contiguously and with one or more interval lags on the independent variable behaviour to represent the consequential nature of the event on the dependent variables. For example, holding on-task behaviour and competing behaviour constant whilst lagging teacher reprimand or reprimand and behaviour talk one interval, the subsequent correlation more accurately showing the behaviour-subsequent event relationship.

Most analyses are undertaken with duration (seconds per minute) records which better reflect the topography, the temporal relations, of the behaviour than would a frequency count.

Many of the above-described issues in previous descriptive and functional analyses and questions raised in the literature review have been addressed in the following descriptive analyses.

The study is an exploratory analysis principally correlational between teacher verbal behaviour and proximity to a target student (the independent variables) and student on-task and unwanted behaviour (the dependent variables).

Continuous duration records enable a focus on time spent in an activity, on extended patterns of behaviour and correlations (behaviour-subsequent event relations over time) rather than response rate (Baum, 2003, the molar analysis of behaviour). This allows for lagging the independent variable relative to dependent variables to better reflect the subsequent (and/or protracted) nature of the independent variables, such as praise and reprimand, and the changing relationships over time. If a positive relationship exists between a behaviour and a subsequent event that behaviour will come to prevail in that situation given lesser correlations for other behaviour - the Correlation-Based Law of Effect (Baum, 1973).

2 Method

2.1 Setting

The settings were general education classrooms in Primary (deciles 2, 3 and 1[1]; year levels 1 to 6; ages 5 years to 11 years) and Intermediate Schools (decile 2 and 8; year levels 7 and 8; ages 11 years to 12 years) in the Hastings and Napier areas in State Schools and in a State Integrated Secondary School (decile 4; levels 9 to 13; ages 13 to 18).

The Secondary School was a State Integrated (i.e. state funded) religion-based single sex (male) school.

Table 2.1.1 *Type, Decile Rating and Year Level of Schools in the Study*

School and School Code:	Decile Rating:	School Type:	Year Levels:
401 Intermediate.	8	Intermediate	7 and 8
403 Intermediate.	2	Intermediate	7 and 8
406 Primary School.	3	Primary	1 to 6
404 Primary School.	1	composite	1 to 8
405 School.	2	composite	1 to 8
402 College.	4	Secondary	9 to 13

[1] *"The decile rating is the indicator used to measure the extent to which schools draw pupils from low socio-economic communities. A decile is a 10% grouping.*

Decile 1 schools are the 10% of schools with the highest proportion of students from low socio-economic communities. Decile 10 schools are the 10% of schools with the lowest proportion of these students. A school's decile does not indicate the overall socio-economic mix of the school.

Each state and state integrated school (except Health Camp, Hospital, and Department of Child, Youth and Family Service schools), is ranked into a decile on the basis of the indicator. The indicator is based on Census data for households with school-aged children in each school's catchment area." Resourcing Handbook Chapter 1: Operational Funding NZ Ministry of Education.

http://bbb.minedu.govt.nz/index.cfm?layout=document&documentid=5958&data=l#P13_908

2.2 Participants

Participants were teachers and students within ‘mainstream’ schools across different year levels (years 2–13). Several teachers participated in the study reported having difficulties with classroom management (17 sessions).

Classes recorded in Primary and Intermediate Schools were mainly general in nature (reading writing arithmetic and or topic based (one art class). Subjects recorded in the Secondary School included mathematics, English and religious studies.

Twenty six teachers participated in the study. Years teaching experience ranged from 4 to 43 years, the mean was 16.9 years, median 15 years. 62 students participated, six were Primary School students, 32 were Intermediate School and 24 Secondary School.

The research was focused on observing and describing teacher practice during normal classroom interactions and tasks and student responses to these.

There was no necessity to personally identify either teachers, students or classes. School identities were retained simply for ease of recognition.

Participation was voluntary.

All Sessions by Year Level, Class Subject, Teacher Experience and Gender

Total Schools=6

Total Sessions=72

Number of Teachers=26

Number of Students=62

Teaching Experience:	Gender of Teachers:	Gender of Students:
Mean=16.45	Male=30	Male=55

Median=17	Female=42	Female=17
Range=4–43 years		

31 recorded sessions were general classes, 6 Art, 27 Maths, 6 English Language, and 2 Religious Studies.

The number of sessions in each Section varies because of trying to maximise the inclusion of sessions for the different analyses. Hence, the total number of sessions for All Data Combined (N=72) differs from the combined total for Those Teachers with Expressed Management Difficulty (N=17) and Other Teachers (N=53). The combination for the latter is N=70.

The complete information is shown in tabular form in Appendix 3.

2.3 Procedure

The initial approach to schools was conducted by the researcher. Discussion of the research project and the requisite consents were presented, any additional requirements by the school discussed and incorporated.

Additional to attaining the above consents, the information sheet[2] regarding the research was discussed thus providing opportunity to discuss the implications of the research and how this is likely to impact on them, and the consent for participation[3]. Children who did not wish to be included in the study were offered alternative classes for the duration of recording. None chose this option.

The class teacher discussed the nature of the research with their own classes prior to videoing. Most teachers requested feedback on their teaching.

The video equipment was located at the rear of the class directed to record the area of predominant teacher instruction. The camera remained focussed on the

[2] *Appendix 1. Research Information Sheet*

[3] *Appendix 2. Consent Forms for Participation in the Study*

teacher (their stated predominant position for class instruction) and remained static i.e. there was no 'panning' of the camera. Some teachers consented to participation given there was no additional person within the classroom. These teachers were shown how to turn the recording equipment on and off.

Video recording was undertaken using a Sony HDR-SR12E handycam with a wide-angle lens mounted on a tripod. Two wireless lapel microphones input through a wireless VHF receiver (Aory, AR-630). One wireless lapel microphone was attached to the teacher, the other centrally mounted in the ceiling of the classroom. Some of the class rooms were equipped with teacher worn microphones and 'surround sound', audible to all within the classroom, which enhanced recordings. All teachers, of their own volition, turned these off when talking to individuals.

The students to be included in the study were not nominated prior to recording. Selection was based on them being accessible to the camera and overhead microphone.

Participants were only involved in observations. The total possible observation period was of one and a half hours duration for Intermediate Schools and of 45 minutes in the Primary and Secondary Schools. Observation periods were delimited by established breaks in classroom instruction.

Mostly, three observation sessions were recorded per class as recommended by Shih (2013).

Recordings were conducted during periods of teacher whole class instruction, directed whole class at deskwork, and at deskwork whilst the teacher took a group of children within the class.

2.4 Storage and Disposal of Data

Data was collected in video form, transferred to DVD, analysed and archived electronically in numerical form for further analysis, for reference purposes and availability for secondary analysis.

2.5 Method Followed for Preserving Confidentiality and Anonymity

No personal identifying information was required for the study and none kept. Children were aware that their behaviour would be recorded and subsequently analysed.

Information retained was: age; 'decile' rating of the school; whether the school was a Primary, Intermediate or High School, and the behaviour observation data.

Data was only discussed with the second observer in so far as training and improving reliability was concerned and with university supervisors.

2.6 Measurement

Data recording was undertaken from the DVDs using especially developed software (Waikato University)[4.] This programme enabled the playing of the DVDs alongside the behaviour recording keys for the teacher, the target child and other children (students). Recordings were saved to SQL data base and subsequently converted to excel data base in 60 second intervals.

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[4] This programme was developed by Andrew Malcom, computer programmer, Psychology Department, University of Waikato. Refer Appendix 5 for more specific information regarding the development of the programme and functioning.

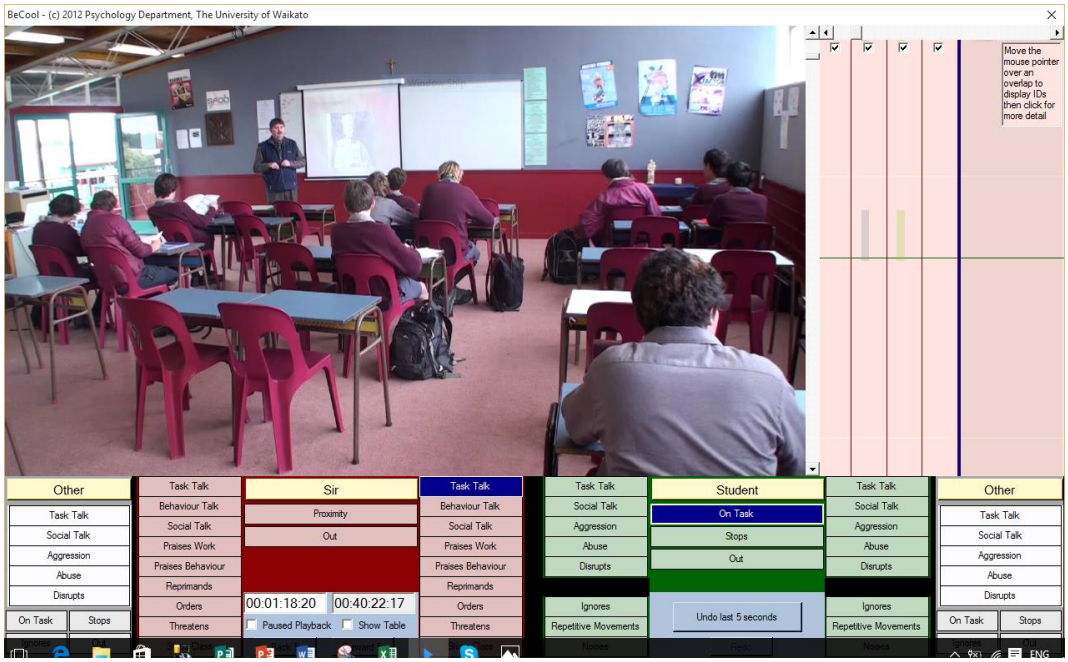


Figure 2.6.1 Screen Shot of Computer Recording Programme

Interactions between the teacher, the target child, other children and the whole class were recorded concomitant with 'on task' behaviour as defined in the observation code (2.7).

Observers were trained in the use of the observation code until reliable recordings were attained. This involved repeated practice on a ten minute observation period to establish familiarity in the use of the keys and codes differentiating teacher and student behaviour and the target of that behaviour. For example, a right click on the mouse for any teacher verbal behaviour indicated talk to the whole class, a left click on the right side of the teacher verbal behaviour column, teacher talk to the target student. A left click on a behaviour on the column to the left of the teacher verbal behaviour column indicated teacher talk to other students. Similarly, other student talk to the teacher was recorded by a left click on the behaviour in that column and target student behaviour was recordable to both the teacher and to other students by a left click on the appropriate behaviour. Once familiarity with and fluency of recording were achieved with ongoing clarification of definition, further practice with agreements and disagreements were ascertained within that sample until records greater than 85% were achieved. Further practice was undertaken with different samples to ensure agreement above that level of agreement.

Recordings were conducted during periods of teacher whole and partial class instruction (group work within the class whilst others doing other activities) and directed, whole and partial class at desk work. Recordings were of one and one half hour duration in Intermediate Schools, and approximately 35 minutes in Primary and Secondary Schools.

2.7 Observation Code

All recordings are duration recording (seconds).

Behaviour Definitions

Proximity – teacher within two metres of the target student or target student has moved to within that proximity of the teacher.

Task Talk – any talk directly related to the immediate topic or task (academic or related to). Any direction, instruction or request to perform an academic task, prompts to work or to extend work effort or activity. Also, general class instruction.

Behaviour Talk – any talk related to general conduct, deportment, interactive behaviour, etc. For example, teacher prompts for appropriate social behaviour such as courtesy, turn taking, etc., qualitative comment on behaviour (negative).

Social Talk – social and not academic talk e.g. any talk not directly related to the immediate topic or task: silly talk; any talk that is personalised e.g. family, sporting achievement, etc...

Praises Work – praise for work, work effort.

Praises Behaviour – praise for social behaviour e.g. courtesy, consideration of others, turn taking, etc.

Reprimands – rebukes or forcefully tells off for misconduct, nil or poor performance, does not include lecture concerning expected behaviour, rules, etc. (behaviour talk).

Orders – instructs to do with emphasis.

Threatens – 'do or else.' Threatens with consequences, immediate or delayed.

Stops Class – teacher engages in behaviour to stop class – clapping, hand up, silence, etc.

Out – teacher becomes invisible e.g. working by self, individual tuition that makes her/his presence not visible to the target student, or out of the room. Student leaves the room with or without teacher permission.

On Task – target student working as instructed or attending to instruction. Can be doing other things at the same time e.g. 'doodling whilst' listening if the behaviour is not imposing/disruptive. Also for compliance with instruction (does not include 'immobility (head down non-responsive) during reprimand).

Aggression – threatening physical harm, verbal and or physical intimidation, throwing things at a person, hitting.

Abuse – denigrating or derogatory remarks, answers back or argues after instruction or reprimand (not to seek clarification of instruction), makes fun of, etc...

Disrupts – imposition on an individual, group or class as a whole, such that it stops what is occurring e.g. throwing object(s) any distance, any physically provocative act e.g. poking another child with finger or object.

Ignores – does not respond to verbal approach/instruction/direction, and latency of response (waiting before complying).

Repetitive Movements – continual movements e.g. rocking on chair, tapping, pen clicking, etc.

Noises – odd or repetitive noises, singing, banging desk or chair, laughing loudly in a denigrating or attention-seeking manner, yelling.

Stops – disruptive or imposing behaviour stops (event record).

2.8 Further Differentiation of Behaviour by Target

The behaviour was further differentiated by target i.e. whether the teacher's verbal behaviour was directed to the whole class, the target student or other student and for the target student whether their behaviour was directed to the teacher or another student.

Thus, teacher task talk, 202 indicates teacher task talk to the whole class; 220 indicates teacher task talk to the target student, and 221 indicates teacher task talk to other students.

Similarly, 207 represents teacher reprimands the whole class, 270 teacher reprimands the target student and 271 teacher reprimands other students, and so on.

The respective behaviour can be summed to reflect all teacher task talk, (202/220/221) and all teacher reprimands (207/270/271).

Within the results such summation is conducted and set against 'student on-task' behaviour (301/302/320) and what has been categorised as 'unwanted or competing behaviour' (304/05/06/07/08/330/40/50/60/70). This is illustrated in the following Table 2.8.1.

Table 2.8.1 List of Teacher and Student Directed Behaviour

Teacher Behaviour	**Code**	**Target**	**Code**	**Target**	**Code**	**Target**
proximity	201	to target student only				
task talk	202	to whole class	220	to target student	221	to other student
behaviour talk	203	to whole class	230	to target student	231	to other student
social talk	204	to whole class	240	to target student	241	to other student
praises work	205	to whole class	250	to target student	251	to other student
praises behaviour	206	to whole class	260	to target student	261	to other student
reprimands	207	to whole class	270	to target student	271	to other student
orders	208	to whole class	280	to target student	281	to other student
threatens	209	to whole class	290	to target student	291	to other student
stops class	210	to whole class				
out of class	211	teacher only				
Student Behaviour	**Code**	**Target**				
on task	301	target student only			**Code**	**Target**
task talk	302	to teacher			320	to other student
social talk	303	to teacher			330	to other student
aggressive behaviour	304	to teacher			340	to other student
abuse	305	to teacher			350	to other student
disrupts	306	to teacher			360	to other student
ignores	307	to teacher			370	to other student
repetitive movements	308	target student only			380	to other student
noises	309	target student only			390	to other student
stops	310	target student only				
out of class	311	target student only				

2.9 Inter-Observer Agreement

Inter-observer agreement was assessed on 10 minutes of all sessions (recordings of one minute interval). Data was obtained from having the secondary observer, a graduate in anthropology, record behaviour from the same video clip as the primary observer (the author). Agreement was calculated by dividing agreements by agreements plus disagreements and multiplying by 100 for each behaviour for each reliability session[5].

2.10 Data Analysis

1. 'Rates' (incidents per minute) and 'duration' (seconds per minutes) of teacher task talk (task talk), praise, reprimand, behaviour talk, social talk and teacher proximity to the target student were calculated and differentiated based on the target of the teacher verbal behaviour (toward the whole class, toward the target student, toward other students and combined). Incidents per minute was calculated from the duration (seconds per minute) record:
    a. across year levels;
    b. across Primary, Intermediate and Secondary School classes;
    c. for one student and two teachers;
    d. for a sample of teachers having expressed management difficulty and others not having done so; and
    e. for all sessions combined. This as a means of deducing differences, if any, between them and for comparison with previous studies.

    The basic data are the means of samples constituting the above analyses.

Data showing on-task behaviour (recorded as on task, task talk to teacher, and task talk to others), unwanted behaviour (social talk to other children and disruptive behaviour), teacher task talk to other children, teacher task talk to the whole class, and teacher task talk to the target child were collated such that

[5] *Macros for calculating inter-observer agreement were developed by Neil Martin of Antam Ltd.*

relationships between different 'levels' of teacher task talk could be explored (the independent variable). This particularly in respect to the relationships between student on-task behaviour and unwanted or competing behaviour (the dependent variables). Comparative data was analysed alongside relevant correlation tables (matrices). The data was truncated, shortened to 34 intervals such that correlation tables could be constructed. Results from Primary Schools were of equivalent length prior to 'natural' breaks in instruction – 'brain food' break in Primary School and end of class in Secondary School. Intermediate School classes were of 94 intervals duration. Analyses are of 34 intervals unless otherwise stated. Primary correlation tables were constructed using seconds per minute data alone which was summed within 60 second intervals and averaged across the particular samples. All Tables and Figures represent these mean values. Each data point represents the average occurrence of that behaviour for that sample. This measure included all data from within-session recordings and represents all data recorded on a continuous basis. This enables a more accurate analysis of the temporal relationships between the independent and dependent variables (Rapp et al., 2001), than would be found in temporally discontinuous or interval recording ('incidence per minute' in this study).

Cross-lagged correlations were calculated in some cases (praise and reprimand) with one or more interval lags on praise and reprimand (and behaviour talk) to assess the behaviour- subsequent event nature of the respective independent and dependent variables (student on-task and unwanted behaviour). Contiguous correlations do not show the temporal relations sufficiently, for example, teacher praise succeeding student on-task behaviour and reprimand succeeding student unwanted behaviour. By comparing the strength of the relationship between each dependent variable with the independent variable at the first point in time (lag =0), then with the independent variable at the second point in time (lag =1 interval) and then a two intervals lag with the dependent variables stationary, the maximum (optimal) correlation between these variables can be found which indicates the time taken for the effect (the independent variable) to impact on the value of the other or the protracted nature of or latency of the independent variable (Randolf, 1981). This analysis enables the concomitant analysis of the independent variable with the dependent variables and comparison of the strength of relationships over time, in

accord with research-established parameters of reinforcement and punishment, such as immediacy, contingency, consistency and effectiveness. Effectiveness in this case is evidenced by the changing strength and direction (valence) of relationships (lag =0, =1, =2, =3) across intervals. Positive significant relationships between the independent (reprimand) variable and student unwanted behaviour indicating a high correspondence in occurrence. A large negative relationship with on-task behaviour indicating a suppression effect on this dependent variable. Immediacy of effect of reprimand would be evident in a reversal of the strengths and valences of these relationships in the subsequent interval (lag =2) – a large positive relationship with student on-task behaviour and negative relationship with student unwanted behaviour indicating a reinforcing effect on student on-task behaviour and suppressing effect on unwanted behaviour. Analysing the effect of the independent variable on the dependent variable in this manner is defining functional relationships - consequences are defined by their effect on behaviour. "What Skinner asserted is that reinforcers are what reinforcers do, and one can only make this determination after the fact, once an event has followed behavior and the behavior has measurably accelerated." (Critchfield & Miller, 2017). Similarly, a punisher is defined by its effect, the suppression of the behaviour it follows (Lerman & Vorndran, 2002).

Pearson's correlation coefficient was used to ascertain the strength between all continuous variables. Correlation matrices were constructed in excel. An alpha level of .05 was used in all tests of statistical significance which were derived from critical value tables for two-tailed tests. The latter so as not to preclude direction or valance of the relationship. Descriptions are based on Cohen's (1992) thresholds for small (r= 0.1 – 0.3), medium (r= 0.3 – 0.5), large effects (r= 0.5 – 0.7) and very large (Rosenthal, 1996) effects (r= 0.7).

Percentages of teacher praise and reprimand were calculated relative to student on-task and unwanted behaviour respectively to deduce the occurrence of these compared with the referent or background occurrence of student on-task behaviour and teacher reprimand (and behaviour talk) with student unwanted behaviour. This giving an indication of the consistency, contingency and immediacy of the relationship between the independent and dependent variables.

2. Results were recorded graphically to further illustrate relations over time. Teacher verbal behaviour was correlated with student on-task behaviour and unwanted or competing behaviour. Teacher social talk, behaviour talk, and proximity to a target student were similarly analysed.

3 An individual evaluation (a case study) was undertaken wherein a teacher who was experiencing considerable difficulty in classroom management and teaching was instructed to:

a. increase task talk and to maintain this as a public phenomenon in the first condition, and;
b. in the second condition, more specific instruction was given: to as much as possible respond to all unwanted or competing behaviour with a task or work-related response (in addition to maintaining Intervention a.). This included responding to unwanted behaviour with task talk and continuing with this. Additionally, to 'talk out' whatever was being written on the 'white board' as it was being written.

3 Research Question

3.1 Statement of the Research Question with Hypotheses

Statement of the Research Question

The purpose of the present study was to use descriptive analysis, principally correlational analysis, to look at the relationship between rates of teacher task talk and social consequences (positive and negative) in respect to student on-task and unwanted behaviour (the dependent variables) in classroom settings. It is an exploratory analysis. The independent variables are teacher verbal behaviour (task talk, praise, social talk, reprimand, behaviour talk, particularly teacher task talk) and proximity to a target student, the dependent variables student on-task and unwanted behaviour.

Hypotheses

It would be expected that:

Hypothesis $H_{overarching}$ The overarching hypothesis is that increasing the rate of teacher task talk that is public (accessible to the target student) improves student functioning within the classroom. This more so than would a teacher-student focus alone.

Hypothesis H_1 A high rate of teacher task talk would be associated with a high rate of student on-task behaviour**.** High rates of teacher task talk are both discriminative stimuli for students gaining and maintaining task orientation, and are prescriptive or defining of the contingency operating for student attention and behaviour. *This would be evident in a significant positive correlation between the independent variables, the rate of teacher task talk to the whole class (202) and*

combined (202/220/221) and the dependent variable, student on-task behaviour (301/302/320).

Hypothesis H_2 A high rate of teacher task talk would be associated with reduced rates of student unwanted or competing behaviour. Competing or unwanted behaviour, such as talking with peers, would be expected to be more manifest in the 'void' created by less teacher task talk. *This would be evident in a significant negative correlation between the independent variable, teacher task talk to the whole class (202) and combined (202/220/221), and the dependent variable, student unwanted or competing behaviour.*

Hypothesis H_3 A high rate of teacher task talk is the defining condition under which reprimands and behaviour talk reduce student unwanted or competing behaviour and maintain a high rate of student on-task behaviour. *This would be evident in fewer reprimands and behaviour talk, in reprimands and behaviour talk being of shorter duration, greater association of reprimand and behaviour talk with unwanted behaviour, and subsequently, a significant negative relationship between teacher reprimands and behaviour talk and student unwanted behaviour, and a significant positive relationship with student on-task behaviour, for those teachers evidencing high rates of teacher task talk. This indicating a conditional functional relationship.*

Reprimand and behaviour talk are analysed severally and combined. Behaviour talk, or talk about conduct, is often sequalae to, or is used as an alternative to reprimand.

Hypothesis H_4 A high rate of teacher task talk would be associated with a high rate of student on-task behaviour and with praise being significantly related to both variables. *This would be evident in a significant positive correlation between teacher praise and student on-task behaviour given a high rate of teacher task talk. That is a conditional functional relationship.*

4 Results

Recordings were obtained across years 2 to 13. A target child was chosen on the basis that he or she was central to the video recording and accessible to the microphone. There was only minimal, aperiodic indication that either teachers or students were aware of the camera. In one instance, a student responded to and texted on his cell phone directly in front of the camera – such behaviour was characteristically responded to by confiscation of the phone by the school until the end of term.

4.1 Inter-Observer Agreement

Observations were conducted on each session for ten minutes. The second independent observer was practiced on video recordings until behaviour could be identified sufficiently quickly and reliably and was able to retain fluency of recordings. The percentage agreement 'cut off' in practice was 85%. Inter observer agreement recordings constituted approximately 33% of each observation period. Observations were calculated on 60 second intervals. Interval lengths were chosen in consideration of the number of data points, comparison with previous studies that presented rates of behaviour per minute, and it was considered sufficiently small to enable consideration of the hypotheses. Agreement was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100. Mean occurrence agreement 97.65%, median 98.99%, and range 62.13% to 100% were calculated by behaviour across sessions. For teacher task talk to other students (code: 221) mean agreement was 85.79%, median of 86.6%. Recording differentiating this behaviour from teacher task talk to the whole class (code: 202) was difficult to adjudge in so far as addressing how many students represents the whole class. Mean agreement for the latter was 91.31%, median agreement 95.83%.

Recording behaviour has inherent difficulties in that recognition of the behaviour can only be made subsequent to the behaviour occurring. This issue was overcome partially by viewing the sessions prior to recording them, repetitive use

of the 5 second ‘undo’ button (Appendix 5), and with the secondary observer able to check their recordings for errors of omission or commission of behavioural definition (and to an extent in respect to duration) independently prior to presenting them for analysis. Initially this editing process resulted in duplicates occurring in the data base which were subsequently removed.

This information is presented in Appendix 4. both in tabular form and graphically. Table 4.1.1 Inter-Observer Agreement, and graphically in Figure 4.1.1.

4.2 Restatement of the Research Question

The purpose of the present study was to use descriptive analysis, principally correlational analysis, to look at the relationship between rates of teacher task talk and social consequences (positive and negative) in respect to student on-task and unwanted behaviour (the dependent variables) in classroom settings. It is an exploratory analysis focussing on extended patterns of behaviour and correlations (behaviour-subsequent event relations over time) rather than response rate (Baum, 2003). The independent variables are teacher verbal behaviour (task talk, praise, social talk, reprimand, behaviour talk, particularly teacher task talk) and proximity to a target student, the dependent variables student on-task and unwanted behaviour. Recording behaviour continuously enabled the presentation of data graphically such that variations in rate were visible across time and the correspondence with correlations more descriptive and explanatory.

4.3 Results Overview

The results and discussion are presented in the following Chapter 5, Sections 5.1–5.6, and Chapter 6, Sections 6.1–6.8, respectively, along with relevant tables, figures, correlations and commentary. An overview of the Chapter structures is included below.

Chapter 5. Teacher and Student Classroom Behaviour:

For Sections 5.1–5.5 analyses mostly cover the following format:

a) Teacher task talk,
b) Teacher praise,
c) Teacher reprimand and behaviour talk,
d) Teacher social talk,
e) Teacher proximity to the target student and
f) Summary and Discussion.

Teacher verbal behaviour directed to the target student alone is assayed at the beginning of each Section, subsequently all teacher verbal behaviour (to the whole class, the target student and other students summed), and the relationship with student on-task and unwanted behaviour.

Chapter 6. Teacher Verbal Behaviour and Proximity, Summary and Discussion

For Sections 6.1 – 6.5, analyses mostly cover the following format.

a) Across Year levels,
b) Across Primary Intermediate and Secondary Schools,
c) All Data Combined (N=72),
d) For One Student and Two Teachers,
e) For those Teachers with Expressed Management Difficulty (N=17) and Other Teachers (N=53).

5 Teacher and Student Classroom Behaviour

5.1 Teacher and Student Classroom Behaviour across Year levels

Introduction

Considerable research attention has been directed toward teacher student interactions within the classroom particularly teacher approval (praise) and disapproval (reprimand). Normally, children's' behaviour is seen as primarily under the control of praise, reprimands and attention, consequences which are readily deliverable (Van Houten & Doleys 1983).

Descriptive research has shown attention, particularly reprimands, to be the most common consequence for problem behaviour across institutional, classroom and home settings (Strain, Lambert, Kerr, Stagg & Lenkner, 1983; Shores, 1983; Nafpaktitis, Mayer and Butterworth, 1985; Rosen, Taylor, O'Leary & Sanderson, 1990; Jack, Gunter, Ellis, DeBriere & Wehby, 1993; Wilks, 1996; McKerchar & Thompson, 2004; Minton, Kagan & Levine, 1971; Schaffer & Crook, 1978). Further, that aggression is more likely to elicit attention than other problem behaviour (Thompson & Iwata, 2001). The focus of this research on problem behaviour and their effects has resulted in the neglect of other potential relationships, such as is found in rule governed behaviour as a determinant of on-task behaviour (Fantino, 2004), or consideration of the greater social context in which the behaviour occurs (Carr, 1994).

Minimal research attention has been given to teacher verbal behaviour beyond praise and reprimand, such as task talk, social or conversational talk and talk about behaviour or conduct. The latter is often an integral part of the reprimand process or an alternative to reprimand. This is also pertinent to the relationships between teacher verbal behaviour and teacher proximity to a target student.

Teacher proximity to students has been found to enhance the effectiveness of both praise (Feldman, 2003; Shores et al., 1993) and reprimand (Pfiffner, O'Leary, Rosen & Sanderson, 1985; Van Houten, Nau, Mackenzie-Keating, Sameoto & Colavecchia, 1982) but has not been evaluated greatly beyond this.

The impact on students of teacher talk (to the individual student, to other students, to the whole class and combined) that is targeted, has only received minimal attention. This is also the case for student task talk to the teacher and to other students included with student on-task behaviour and student social talk to other students differentiated from other unwanted behaviour. Combined, these verbal behaviours constitute a more complete description of the verbal and social context in which student on-task or unwanted behaviour occurs and thus provide a richer description of the variables that might be influencing that behaviour (Carr, 1994). The base-rates of teacher verbal behaviour (the independent variable in the current study), have not been studied for student on-task and unwanted behaviour (the dependent variable here), nor differences if any, across age levels. Both are surprising omissions given the predominant teacher behaviour within the classroom setting is teacher instructional or academic talk (Wehby and Yoder, 2002), and the predominant student behaviour, compliance with instruction or on-task behaviour (Ndoro et al., 2006). Sutherland (2005) in his summary of descriptive studies of classroom behaviour, stated that they are ''characterised by little reinforcement for prosocial behaviour and high rates of responses to disruptive behaviour.'' (p.7) "Most task talk was neutral'' (O'Leary and Sanderson, 1990, p.257), but then why should teacher task talk need to be qualitative in nature, (as are praise and reprimand) to be reinforcing? Why shouldn't the relationship of task talk with student on-task and unwanted behaviour be worthy of specific study?

Correlational studies have generally shown positive correlations between teacher approval (praise) and student on-task behaviour and negative correlations between teacher disapproval (reprimand) and student on-task behaviour (Gable, et al., 2009; Thomas, et al., 1978; Nafpaktitis, et al., 1985; Wheldall, et al., 1989; Winter, 1990).

In keeping with previous research, it was expected that the occurrence of praise would be low across year levels, irrespective of the many studies (showing

praise (social reinforcement) to be effective in improving social and academic performance (Strain, Lambert, Kerr, Stagg and Lenkner (1983). Early research (White, 1975; Thomas et al., 1978) indicated that the probability of reprimands would be greater than that of praise and both would reduce over year level. More recently, some research has found the opposite, praise occurring at a greater rate than reprimands (Nafpaktitis et al., 1985; Beaman and Wheldall, 2000), although still of minimal rate.

Despite the reported low occurrence of teacher praise in classrooms reported in the research literature, a positive relationship was expected between teacher praise and student on-task behaviour given high rates of teacher task talk within class (Hypothesis H_4).

Intuitively it would be expected that rates of praise (White, 1975), and punishment or reprimand, would reduce across year levels as student behaviour became more congruent with classroom expectation and protocol.

Research has not evaluated teacher task talk in any but a cursory descriptive manner, especially not in respect to the function of task talk. In that the predominant teacher behaviour within the classroom setting is teacher instructional or academic talk (Wehby and Yoder, 2002), the frequency, dispersion and duration of teacher task talk could be hypothesised to be defining the setting event, reinforcement context, teaching relationship and reinforcement for academic performance – providing discriminative stimuli for the maintenance of attention and academic performance, and co-requisite in maintaining this.

The current study The focus of the current study is to assess the relationship between teacher task talk and the proportion of student on-task behaviour in the classroom setting, across a number of student age groups. Teacher proximity to the target student was analysed independently to assess the effect, if any, that proximity had on student on-task and unwanted behaviour and to ascertain what teacher verbal behaviour it was predominantly associated with.

Method

Subjects Participants were teachers and students within 'mainstream' schools across different year levels (years 2–13). Classes recorded in Primary and Intermediate Schools were mainly general in nature (reading writing arithmetic and or topic based (one art class)). Classes recorded in the Secondary School included mathematics, English and religious studies.

Twenty six teachers participated in the study. Teaching experience ranged from 4 to 43 years, the mean was 16.9 years, median 15 years. Sixty two students participated, six were Primary School students, 32 were Intermediate School and 24 Secondary School. Participation was voluntary.

Setting The settings were general education classrooms in Primary and Intermediate Schools in the Hastings and Napier areas in State Schools and in a State Integrated Secondary School.

Three Primary Schools participated (deciles 2, 3 and 1) year levels 1 to 6; ages 5 years to 11 years two of which included year levels 7 and 8; two Intermediate Schools (decile 2 and 8; year levels 7 and 8; ages 11 years to 12 years) and one Secondary School (decile 4; levels 9 to 13; ages 13 to 18). The schools selected include a range of students from varying socio-economic backgrounds.

The Secondary School was a State Integrated (i.e. state funded) religion-based single sex (male) school.

Procedure The procedure followed involved videoing classrooms during normal teacher instruction (Section 2.3).

Data Collection Students in the study were divided in to year level groups in accord with how these were constituted within the different schools. Year levels included level: 2,3,4, levels 5 &6, 7 &8 combined, 9,10,11,12, and 13. The combined levels were due to the mix of students within the classes. The numbers of subjects per year level were: 1,2,1,2,32,5,7,3,6 and 3 respectively.

Data Analysis Behaviour observation codes are described in Section 2.7, inter-observer agreement in Section 2.9 and Section 4.1 of the Results Section. Agreement was calculated by dividing the number of agreements by the number of disagreements and multiplying by 100%. Mean occurrence agreement for the dependent and independent variables was 97.65%, and median 98.99%.

Rates (incidents per minute) and duration (seconds of occurrence per minute) of praise and reprimand were calculated across year levels for comparison with previous studies (Rapp et al., 2001). The proportion of teacher task talk relative to other teacher verbal behaviour (Hypothesis H_1) was the primary measure of the independent variable.

The on-task and unwanted behaviour of the target child is taken as a proxy measure of class performance (the dependent variable). Student off task behaviour was not measured as it is the reciprocal of on-task behaviour. Student unwanted behaviour includes social talk to other students, disruptive behaviour, aggression, abuse etc., as outlined in the Section relating to behaviour definitions. The direction or target of teacher and student behaviour are measured, for example, teacher task talk to the target student, to other students and to the whole class, the direction of student behaviour is toward the teacher or other students. The combined data for each year level was truncated (made of equal interval length) to enable correlation tables to be completed and independent variables correlated with dependent variables. Primary correlation tables were constructed using seconds per minute data alone which was summed within 60 second intervals. This measure included all data from within-session real-time recordings and represents all data recorded on a continuous basis. Continual recordings and correlations enable a more accurate analysis of the temporal relationships between the independent and dependent variables (Rapp et al., 2001; Baum, 2003), than would be found in temporally discontinuous or interval recording ('incidents per minute' in this study). Results were recorded graphically to further illustrate relations over time. Teacher behaviour was correlated with on-task behaviour and unwanted or competing behaviour (all correlations are two-tailed tests). All Figures and Tables represent the mean values for those particular analyses (year level). Correlation matrices were constructed from this data.

Results

a. Teacher Verbal Behaviour Directed to the Target Student by Year Level

Incidents per minutes are calculated on the basis of whether the behaviour occurred or did not occur in any interval (partial interval recording). An incidence of 0.5 indicates that the behaviour occurred in 50% of recorded intervals. Thus, incidence reflects the number of intervals in which the behaviour occurred for the duration of the observation.

Table 5.1.1 Mean Rate (Incidents per Minute) of Teacher Task Talk, Behaviour Talk, Social Talk, Praise for Work, Praise for Behaviour, and Reprimands to the Target Student across Year Levels

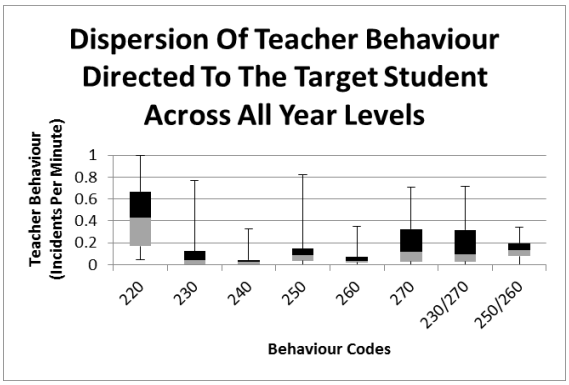
Behaviour:	Behaviour					Year Level:					
	Code:	year 2	year 3	year 4	year 5 & 6	year 7 & 8	year 9	year 10	year 11	year 12	year 13
						incidents per minute					
teacher task talk to target student	220	0.045	0.238	0.407	0.128	1	0.456	0.727	0.148	0.711	0.537
teacher behaviour talk to target student	230	0.045	0	0	0	0.765	0.065	0.145	0.037	0.173	0
teacher social talk to target student	240	0	0	0	0.226	0.324	0.043	0	0.019	0.038	0.037
teacher praises work of target student	250	0	0.024	0.148	0	0.823	0.108	0.2	0.074	0.135	0.074
teacher praises behaviour of target student	260	0	0.048	0	0.025	0.353	0.022	0.145	0.055	0.077	0.018
teacher reprimands target student	270	0.668	0.024	0.037	0	0.706	0.217	0.363	0.037	0.192	0
student on task	301/302/320	0.977273	1	1	1	1	1	1	1	1	1

Teacher verbal behaviour toward the target student is greater in years 7 and 8 across all recorded behaviour. Incidents per minute for all teacher verbal behaviour directed to the target student are minimal. Student on-task behaviour occurs in almost all intervals across all recorded year levels. This dispersion across intervals (Table 5.1.1) is reflected in the corresponding minimal times (seconds per minute) of recorded teacher verbal behaviour toward the target student, Table 5.1.2

Table 5.1.2 Mean Duration (Seconds per Minute) of Teacher Task Talk, Behaviour Talk, Social Talk, Praise for Work, Praise for Behaviour, and Reprimands to the Target Student across Year Levels

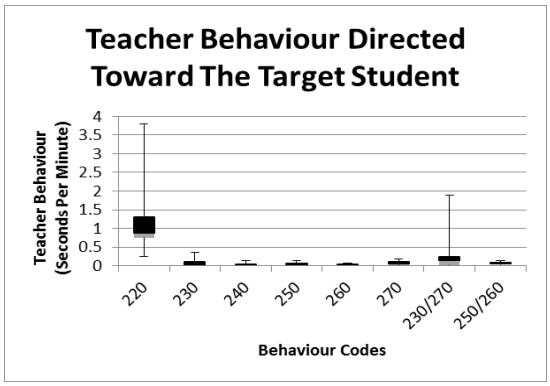
Behaviour:	Behaviour					Year Level:					
	Code:	year 2	year 3	year 4	year 5 & 6	year 7	year 9	year 10	year 11	year 12	year 13
						time (seconds per minute)					
teacher task talk to target student	220	0.25	0.881	1.952	0.295	1.064	0.843	0.722	0.87	1.367	3.808
teacher behaviour talk to target student	230	0.068	0	0	0	0.116	0.017	0.032	0.125	0.356	0
teacher social talk to target student	240	0	0	0	0.013	0.03	0.022	0	0.018	0.125	0.086
teacher praises work of target student	250	0	0.012	0.143	0	0.063	0.026	0.053	0.055	0.012	0.049
teacher praises behaviour of target student	260	0	0.024	0	0.013	0.014	0.004	0.064	0.037	0.048	0.012
teacher reprimands target student	270	0.182	0.012	0.024	0	0.073	0.117	0.147	0.023	0.082	0
student on task behaviour	301/302/320	45.18182	49.55952	50.45238	53.282051	47.28	50.63	48.106	40.514	45.771	48.907

When the rate of teacher verbal behaviour is considered (seconds per minute) for years 7 and 8, teacher task talk (220), behaviour talk (230), social talk (240) and praise for work (250) to the target student are greater than for other year levels. Overall teacher interaction with a particular (the target) student is minimal. If the greater occurrence of teacher verbal behaviour considered, year levels 7 and 8: teacher task talk and praise for work combined is 1.127 seconds per minute; teacher reprimands and behaviour talk combined is 0.189 seconds per minute; teacher social talk, 0.03 seconds per minute; and teacher praise (for work and behaviour) combined is 0.077 seconds per minute. The combined rates (incidents per minute and seconds per minute) across year levels are shown in Figures 5.1.1 and 5.1.2.



Mean	0.440	0.123	0.069	0.159	0.074	0.224	0.998	0.628
Standard Error	0.098	0.074	0.036	0.077	0.034	0.086	0.002	0.091

Figure 5.1.1 Mean Rates of Teacher Behaviour Directed to the Target Student (Incident per Minute) across all Year Levels – Combined Totals



Mean	1.205	0.071	0.029	0.041	0.022	0.066	0.137	0.063
Standard Error	0.328	0.035	0.013	0.014	0.007	0.021	0.044	0.014

Figure 5.1.2 Mean Rates of Teacher Behaviour Directed to the Target Student (Seconds per Minute) across all Year Levels – Combined Totals

Explanation For The Box Graphs:	
Element:	**Meaning:**
Top of upper whisker	Maximum value of the sample
Top of the box	75th percentile of the sample
Line through the box	Median of the sample
Bottom of the box	25th percentile of the sample
Bottom of the lower whisker	Minimum value of the sample

Figures 5.1.1 and 5.1.2 show teacher behaviour directed to the target student: behaviour talk (230); social talk (240); praise for work (250); praise for behaviour (260); reprimand (270); behaviour talk and reprimand combined (230/270); and praise for work and behaviour combined (250/260) are all of minimal value (combined mean = 0.43 seconds per minute) with maximum values

of less than 0.5 seconds per minute (teacher task talk excluded). Teacher reprimands and reprimands and behaviour talk combined are more frequent than praise for work or praise for work and behaviour combined, both in respect to incidents per minute and seconds per minute of the behaviour. Teacher task talk to the target student is the most common teacher student interaction, albeit it too is of low rate (1.251 seconds per minute).

Commentary Teacher verbal behaviour directed to the target student is minimal for both measures.

The incidents per minute of measured teacher verbal behaviour toward the target student (Table 5.1.1) is greater in years 7 and 8 across all recorded behaviour. This reflects that they are more difficult to manage than other age groups and that teacher verbal behaviour is correspondingly more frequent. The lesser dispersion of recorded teacher behaviour across year levels 2 to 5 and 6 is surprising as it was expected that the students' 'newness' to the school system would have been reflected in greater rates of teacher verbal behaviour related to establishing those behaviours essential to maximising learning with minimal impact on the learning of others. This dispersion across intervals is reflected in the corresponding times (seconds per minute) of recorded teacher behaviour (Table 5.1.2.).

The mean of teacher praise for work to the target student (250) is 0.041 seconds per minute, combined with a dispersion over 0.158 intervals (Figure 5.1.3) and mean student on-task behaviour is 47.07 seconds per minute. If all recorded occurrences of teacher praise for work were contingent on student on-task behaviour, the minimal occurrence of praise does not seem sufficient to define on-task behaviour. Teacher praise for behaviour (260) to the target student, mean 0.022 seconds per minute, dispersion 0.074 intervals occurs less often.

Similarly, a mean of teacher reprimands to the target student (270 of 0.066 seconds per minute combined with a dispersion over 0.224 intervals, the independent variable, when mean student unwanted or competing behaviour (Figure 5.1.4.) is 2.196 seconds per minute dispersed over 0.628 intervals, the independent variable, does not seem sufficient by itself to contain or limit that behaviour. Research findings have established punishment to result in a greater

reduction in the response rate of unwanted behaviour if it is delivered on a continuous schedule, is contiguous with, and hence contingent and immediate upon the unwanted behaviour (Spradlin, 2002; Lerman and Vorndran, 2002). The above results do not approximate these research-based parameters.

Teacher Task Talk

If the percentage of teacher task talk to the target student (220) and task talk to the target student and other students combined (220/221) relative to all teacher task talk (202/220/221) is calculated (Table 5.1.3), it can be seen that teacher task talk to students, compared with teacher task talk to the whole class, is considerably greater across years 2 to 7 and 8, relative to subsequent classes – this indicates a considerably greater focus on individual students in junior classes than in Intermediate and Secondary classes. This individual student focus is an inherent aspect of group teaching compared with a whole of class or subject focus which is common in Secondary Schools (years 9 to 13). Year levels 7 and 8 are a transition between the two teaching approaches (Table 5.1.3, Figure 5.1.3).

The information in Table 5.1.3 and Figure 5.1.4 is calculated from seconds per minute of occurrence of teacher task talk and student on-task and unwanted behaviour.

Table 5.1.3 Mean Rate (Seconds per Minute) of Teacher Task Talk to the Whole Class (202), to the Target Student (220), and all Teacher Task Talk to Students (220/221) as a Percentage of the Mean Rates of Total of Teacher Task Talk (202/220/221) and Student On-Task and Unwanted Behaviour Across Year Levels

Behaviour:	Behaviour Code:				Year Level						
		Year 2	Year 3	Year 4	Year 5 & 6	Year 7 & 8	Year 9	Year 10	Year 11	Year 12	Year 13
teacher task talk to whole class	202 as % of 202/220/221	51.490	26.646	32.726	44.316	46.596	74.753	58.921	56.488	70.267	60.812
teacher task talk to all students	220/221 as % of 202/220/221	48.510	73.354	67.274	55.684	53.404	25.247	41.079	43.512	29.733	39.188
sum of teacher task talk	202/220/221	30.500	23.143	24.810	23.231	27.472	35.032	28.419	27.019	33.013	32.386
student on task behaviour	301/302/320	45.182	52.607	50.452	53.282	47.284	52.807	48.106	41.318	45.771	48.907
student unwanted or competing behaviour	330/305/6/7/8/340/350/360	4.182	0.488	0.738	1.538	3.309	2.822	5.802	3.605	2.874	2.358
teacher task talk to target student	220 as % of 202/220/221	0.820	3.807	7.868	1.270	3.873	2.406	2.541	3.220	4.141	11.758

This ‘change over’ or transition is evident in Figure 5.1.3. The percentages of teacher task talk to the whole class (202) and all teacher task talk to the target student and other students (220/221) cross over at the year level 7 and 8, indicating that for the earlier years there is a greater emphasis on an individual student focus and after this (year 9 and on) a whole class focus, wherein the percentage of task

talk to the whole class (202) becomes very similar to all teacher task talk. This data clearly demarks a change in teaching philosophy from the junior classes. The sum of teacher task talk (202/220/221) also increases at year level 7 and 8.

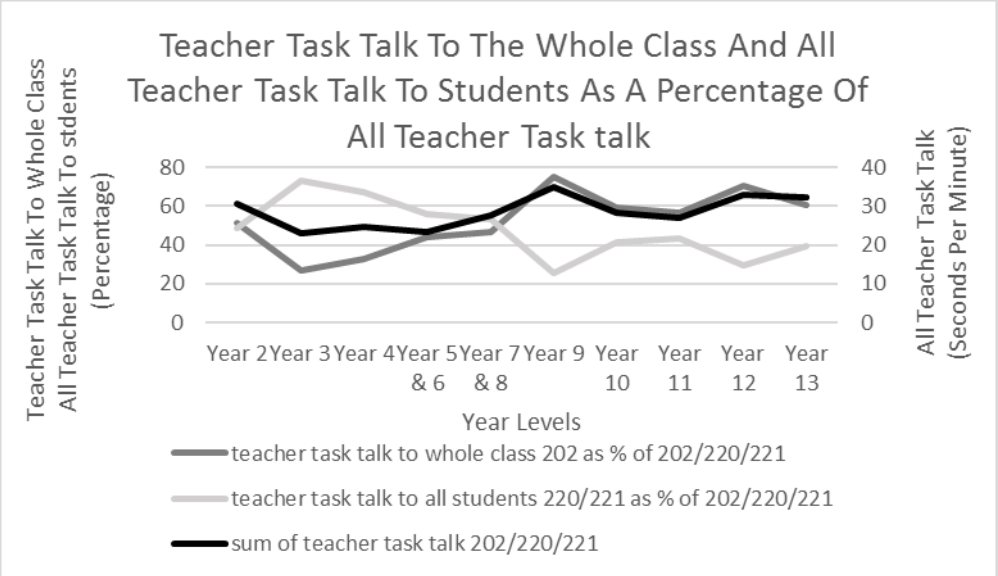
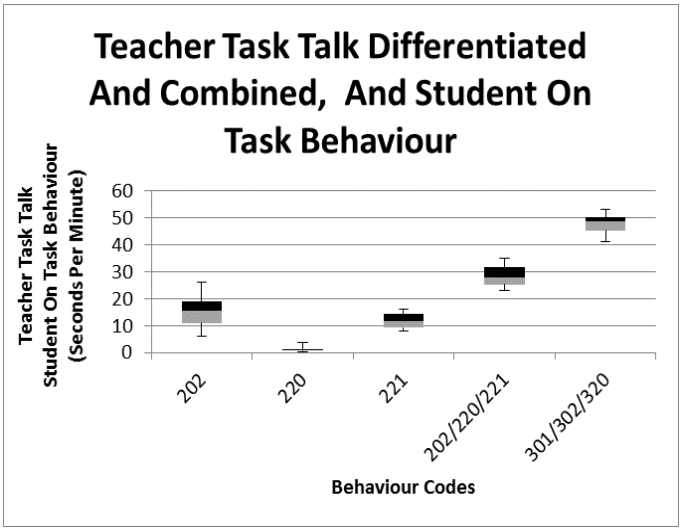


Figure 5.1.3 Mean Rates (Seconds per Minute) across Year Levels of Teacher Task Talk to the Whole Class (202), to the Target Student (220), and to all Students (220/221) as a Percentage of the Mean rate of all Teacher Task Talk (202/220/221)



Mean	15.417	1.251	11.834	28.502	47.070
Standard Error	2.024	0.324	0.915	1.314	1.395

Figure 5.1.4 The Mean Rates (Seconds per Minute) of Teacher Task Talk Differentiated and Combined, and Student On-Task Behaviour – Combined Totals

This transition is reflected in the greater range of teacher task talk to the whole class

(202) in the composite box graph for teacher task talk for all year levels combined (Figure 5.1.4).

Figure 5.1.4. shows that teacher task talk to other students (221) and to the whole class (202) constitute most teacher task-related interaction, more so teacher task talk to the whole class, across all year levels. The range for teacher task talk to the whole class is greater than for the other differentiations of teacher task talk, this reflecting the differential between lower and higher year levels.

The mean of teacher task talk to the individual student is 1.251 seconds per minute, the median 0.973 seconds per minute. Data for task talk to the target student (220) was skewed which reflects the number of zero recordings in the sample or minimal teacher task talk to the target student. The other differentiations were of normal distribution (Shapiro-Wilks test). The 'compactness' of the boxes indicates a 'commonness' in teacher task talk across these differentiations (task talk to the whole class, to other students and combined and particularly with student on-task behaviour).

Table 5.1.4 Correlation of Mean Rates (Seconds per Minute) of Teacher Task Talk Severally and Combined and the Mean Rate of Student On-task Behaviour across Year Levels

Correlation of Teacher Task Talk With	**Data Points Within Samples:**	44	42	42	**39**	34	46	55	54	52	54
Student On Task Behaviour (301/302/320):	**Sample Size:**	**N=1**	**N=2**	**N=1**	**N=2**	**N=32**	**N=5**	**N=7**	**N=3**	**N=6**	**N=3**
	Year Level:	**Year 2**	**Year 3**	**Year 4**	**Year 5 & 6**	**Year 7 & 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**
teacher task talk to whole class	202	0.005	**0.528**	0.032	0.284	**0.484**	**0.453**	**0.368**	-0.097	0.037	0.180
teacher task talk to target student	220	0.112	-0.482	**-0.649**	0.057	-0.036	0.156	-0.078	0.126	-0.263	0.063
teacher task talk to other students	221	-0.122	**0.792**	0.109	0.035	-0.196	-0.240	-0.058	**-0.291**	**-0.488**	0.192
all teacher task talk	202/220/221	-0.136	**0.485**	**0.873**	0.285	**0.384**	**0.424**	**0.323**	-0.217	**-0.292**	**0.339**
highlighted numbers P< 0.05 for total											
sample size (Data Points Within Samples)											

Correlations between teacher task talk to the whole class (202) and all teacher task talk (202/220/221) relate more positively (with respective year levels) with student on-task behaviour than do correlations between teacher task talk to the target student and other students (Table 5.1.5). For correlations within sessions, for years 2, 7, 8, and 10, and 11 (N=42, 34, 46 and 55, r=0.527, r=0.484, r=0.453, r=0.368, $p<0.01$ respectively), these reflect moderate to large relationships and effect sizes. All teacher task talk (202/220/221) correlated positively and significantly for years 2, 3, 7 and 8, 9, 10 and 13. These results show trends

consistent with the expected relationships hypothesised regarding the functional nature of teacher task talk.

Teacher task talk to the whole class for years 7 and 8 was significantly related (by sessions, N=32, r=0.484. $p<0.001$) with student on-task behaviour (301/302/320) as was teacher task talk combined (202/220/221, r=0.384, $p<0.02$). These represent large and moderate relationships and effect sizes respectively (Cohen, 1992).

Table 5.1.5 Correlation of the Mean Rates (Seconds per Minute) of Teacher Task Talk Severally and Combined and the Mean Rates of Student Unwanted or Competing Behaviour across Year Levels

Correlation of Teacher Task Talk With	**Data Points Within Samples:**	**44**	**42**	**42**	**39**	**34**	**46**	**55**	**54**	**52**	**54**
Student Unwanted Behaviour:	**Sample Size:**	**N=1**	**N=2**	**N=1**	**N=2**	**N=32**	**N=5**	**N=7**	**N=3**	**N=6**	**N=3**
	Year Level:	**Year 2**	**Year 3**	**Year 4**	**Year 5 & 6**	**Year 7 & 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**
teacher task talk to whole class	202	-0.075	0.123	-0.199	0.304	**-0.548**	**-0.330**	-0.126	0.091	-0.057	0.022
teacher task talk to target student	220	-0.119	-0.087	-0.030	0.033	-0.085	-0.002	0.154	-0.086	0.279	-0.158
teacher task talk to other students	221	**0.311**	0.130	0.184	-0.090	0.334	0.124	0.207	0.192	**0.463**	-0.204
all teacher task talk	202/220/221	0.278	0.032	0.120	-0.349	-0.358	**-0.316**	0.018	0.169	0.267	-0.195
highlighted numbers P< 0.05 for total											
sample size (Data Points Within Samples)											

Table 5.1.5 shows a large negative relationship between teacher task talk to the whole class (202) and student unwanted behaviour across sessions (N=32) for year levels 7 and 8 (r=-0.548, $p<0.01$). For year 9, moderate negative relationships were obtained within sessions for teacher task talk to the whole class and all teacher task talk combined (N=45), r=-0.330, $p<0.05$ and r=-0.316, $p<0.05$).

Commentary A 'change over' or transition is evident in Figure 5.1.3. wherein the percentages of teacher task talk to the whole class (202) and teacher task talk to students (220/221) cross over at the year level 7 and 8, indicating that for the earlier years there is a greater emphasis on an individual student focus and after this (year 9 and on) the percentage of task talk to the whole class (202) becomes very similar to all teacher task talk. This would be expected from classes of predominant whole class instruction or subject focus rather than an individual student focus.

Correlations between teacher task talk to the whole class (202) and all teacher task talk (202/220/221) relate more positively (with respective year levels) with student on-task behaviour than do correlations between teacher task talk to the target student and other students (Table 5.1.4). These results show trends consistent

with the expected relationships hypothesised regarding the functional nature of teacher task talk.

Table 5.1.5 shows a significant negative correlation between teacher task talk to the whole class (202) and student unwanted behaviour across sessions (N= 32), year 7 and 8. For year 9, negative correlations were obtained within sessions for teacher task talk to the whole class and all teacher task talk combined (N=5). Negative relations were evident across most year levels.

These results were not replicated for teacher task talk to the target student.

The positive correlations found between teacher task talk to other students (221) and student unwanted behaviour, rather than spurious, suggest target student unwanted or competing behaviour is likely to increase given teacher focus on other students. This contention is supported by the negative relationships found between teacher task talk to other students and target student on-task behaviour.

Given the small sample sizes, the obtained correlations indicate relationships consistent with the stated hypotheses regarding the functional nature of teacher task talk in the classroom setting. The across session correlations regarding year 7 and 8 (N=32) are more indicative of the relationship between teacher task talk and student on-task and unwanted behaviour.

Teacher Praise and Reprimands

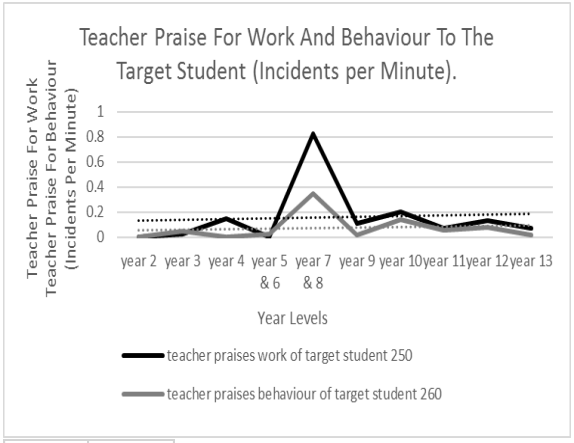
Teacher Praise To The Target Student

Table 5.1.6 Mean Rates (Incidents and Seconds per Minute) of Teacher Praise for Work, for Behaviour, Reprimands and Behaviour Talk Severally and Combined Directed Toward the Target Student Across Year Levels

Teacher Praise For Work And Behaviour					Incidents Per Minute:						
And Reprimands And Behaviour Talk:	Behaviour Code:	year 2	year 3	year 4	year 5 & 6	year 7 & 8	year 9	year 10	year 11	year 12	year 13
teacher praises work of target student	250	0	0.024	0.148	0	0.823	0.108	0.2	0.074	0.135	0.074
teacher praises behaviour of target student	260	0	0.048	0	0.025	0.353	0.022	0.145	0.055	0.077	0.018
teacher praise for work and behaviour	250/260	0	0.072	0.148	0.025	1.176	0.13	1	0.129	0.212	0.092
teacher behaviour talk to target student	230	0.045	0	0	0	0.765	0.065	0.145	0.037	0.173	0
teacher reprimands target student	270	0.668	0.024	0.037	0	0.706	0.217	0.363	0.037	0.192	0
reprimand and behaviour talk to target student	230/270	0.713	0.024	0.037	0	1.471	0.282	1	0.074	0.365	0
Teacher Praise For Work And Behaviour					Seconds Per Minute:						
And Reprimands And Behaviour Talk:	Behaviour Code:	year 2	year 3	year 4	year 5 & 6	year 7 & 8	year 9	year 10	year 11	year 12	year 13
teacher praises work of target student	250	0	0.012	0.143	0	0.063	0.026	0.053	0.055	0.012	0.049
teacher praises behaviour of target student	260	0	0.024	0	0.013	0.014	0.004	0.064	0.037	0.048	0.012
teacher praise for work and behaviour	250/260	0	0.036	0.143	0.013	0.077	0.03	0.117	0.092	0.06	0.061
teacher behaviour talk to target student	230	0.068	0	0	0	0.116	0.017	0.032	0.125	0.356	0
teacher reprimands target student	270	0.182	0.012	0.024	0	0.073	0.117	0.147	0.023	0.082	0
reprimand and behaviour talk to target student	230/270	0.25	0.012	0.024	0	0.189	0.134	1.88	0.148	0.438	0

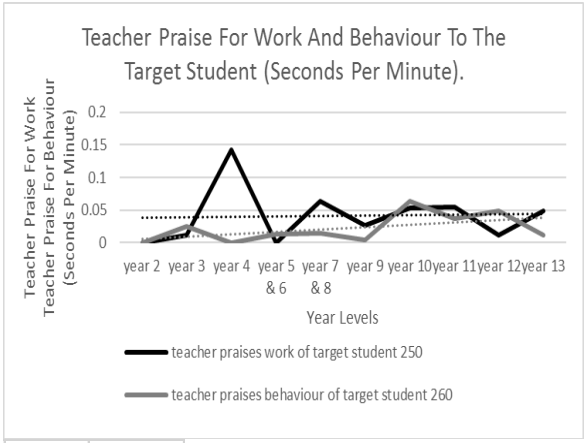
Table 5.1.6 shows all teacher praise for work, praise for behaviour, reprimands and behaviour talk (incidents and duration per minute) separately and combined (250/260 and 230/270 respectively).

Teacher praise for work (250) occurred between 0 and 0.823 of recorded intervals (0 and 0.063 seconds per minute), teacher praise for behaviour (260) between 0 and 0.353 of every interval (0 and 0.064 seconds per minute). Teacher reprimands (270) between 0 and 0.706 (0 and 0.182 seconds per minute) and teacher behaviour talk (230) occurred between 0 and 0.765 (0 and 0.356 seconds per minute) of recorded intervals (Table 5.1.7). Maximum occurrence was consistently so for years 7 and 8. The relationships between occurrence per minute and rate (seconds) per minute are shown in the figures (5.1.5 to 5.1.8).



r = 0.946

Figure 5.1.5 Teacher Praise for Work (250) and Praise for Behaviour (260) to the Target Student with Trend Lines, Mean Rates(Incidents per Minute) Across Year Levels



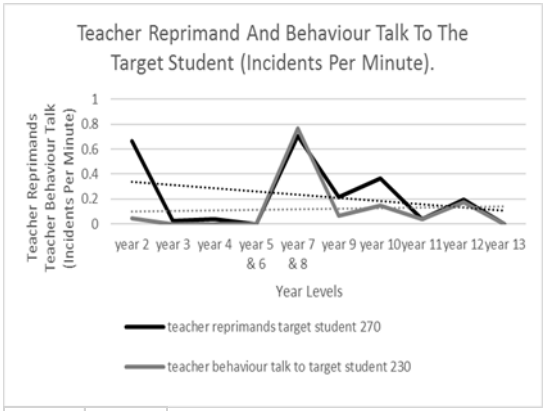
r = -0.127

Figure 5.1.6 Teacher Praise for Work (250) and Praise for Behaviour (260) to the Target Student with Trend Lines, Mean Rates(Seconds per Minute) Across Year Levels

Figures 5.1.5 and 5.1.6 show increases in the occurrence of both praise for work and behaviour at year 7 and 8 after which the incidence of the two decreases and become almost equivalent across year levels. Both incidence and rate (seconds per minute) indicate minimal praise for behaviour overall, particularly in the junior classes relative to the senior classes. Praise for work mostly is greater than praise for behaviour. The trend lines indicate both praise for work and praise for behaviour increasing over year level albeit the incidence and rate relating to the target student are minimal.

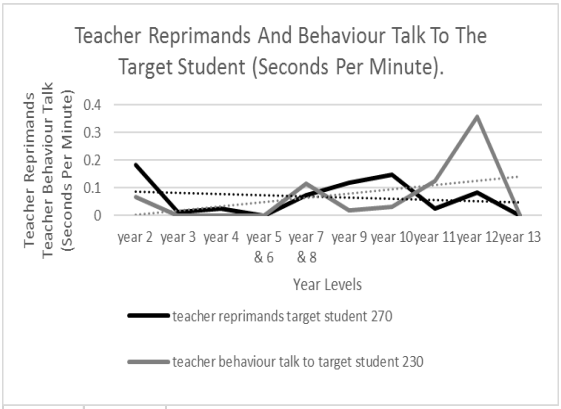
Teacher praise for work and behaviour relate strongly (r=0.946) when measured by incidents per minute, not when the measure is seconds per minute.

Teacher Reprimand and Behaviour Talk to the Target Student



r =	0.694

Figure 5.1.7 Teacher Reprimand (270) and Behaviour Talk (230) to the Target Student with Trend Lines, Mean Rates(Incidents per Minute) Across Year Levels

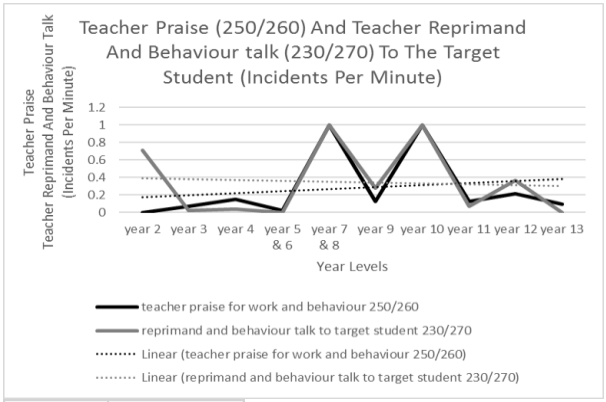


r =	0.192

Figure 5.1.8 Teacher Reprimand (270) and Behaviour Talk (230) to the Target Student) with Trend Lines, Mean Rates(Seconds per Minute) Across Year Levels

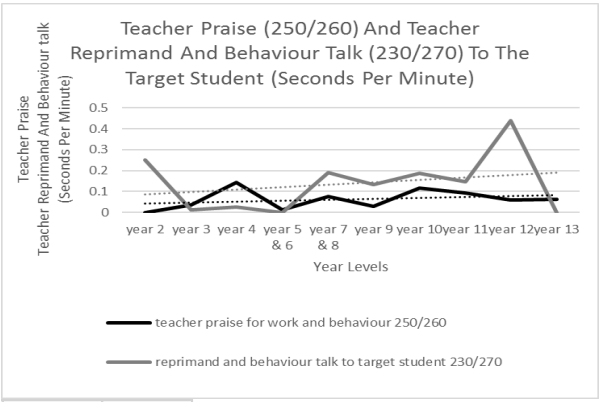
Teacher reprimands and behaviour talk in 7 of the 10 year levels relate strongly (r=0.694) when measured by incident per minute. This is not repeated in respect to rate when measured by seconds per minute.

The trend lines in Figure 5.1.7 and Figure 5.1.8 show the incidence and time (seconds per minute) of teacher reprimand decreasing over year levels and teacher behaviour talk increasing. This indicates that the latter supplants the former with older students (years 11, 12, and 13)



r=	0.813

Figure 5.1.9 Teacher Praise for work and Behaviour (250/260) and Teacher Reprimand and Behaviour Talk (230/270) Combined (Incidents per Minute) with Trend Lines, Mean Rates (Incidents per Minute) Across Year Levels



r =	-0.047

Figure 5.1.10 Teacher Praise for work and Behaviour (250/260) and Teacher Reprimand and Behaviour Talk (230/270) Combined) with Trend Lines, Mean Rates(Seconds per Minute) Across Year Levels

Figures 5.1.9 and 5.1.10 show teacher praise for work and behaviour, and reprimands and behaviour talk to the target student combined for both occurrence (incidents pert minute) and rate (seconds per minute) respectively. For the junior classes (three year levels), praise overall mostly exceeds reprimands and behaviour talk to the target student (seconds per minute), for years 7 and 8 onwards this is reversed. This is consistent with the transition between a student focus and whole class focus previously noted regarding teacher task talk (Figure 5.1.3). The trend lines indicate that the incidence of teacher praise to the target student increases over year levels, reprimands and behaviour talk decrease. When time is considered, both measures increase over year levels, reprimand and behaviour talk to the target student at a greater rate, aside from year 13 where behaviour talk reduces to zero.

The similarity between teacher praise (250/260) and teacher reprimand and behaviour talk (230/270) in Figure 5.1.9 indicates a close relationship between the two in regard to incidence (r=0.869) which is not reflected in respect to rate (seconds per minute), Figure 5.1.10. Correlations between the behaviour are shown beneath the figures.

Table 5.1.7 Correlation between the Mean Rates (Seconds per Minute) of Student On-Task Behaviour and Teacher Verbal Behaviour Directed Toward the Target Student

Correlation Of Student On Task Behaviour	**Data Points Within Samples:**	**44**	**42**	**42**	**39**	**34**	**46**	**55**	**54**	**52**	**54**
With Teacher Behaviour Directed To The	**Sample Size:**	**N=1**	**N=2**	**N=1**	**N=2**	**N=32**	**N=5**	**N=7**	**N=3**	**N=6**	**N=3**
Target Student:	**Year Levels:**	**year 2**	**year 3**	**year 4**	**year 5&6**	**year 7&8**	**year 9**	**year 10**	**year 11**	**year 12**	**year 13**
	Behaviour Code:										
student on task behaviour (seconds per minute)	301/302/320	44.364	49.560	50.452	53.282	47.284	50.626	48.106	41.318	45.771	48.907
teacher task talk	220	0.112	**-0.482**	**-0.649**	0.057	-0.036	0.156	-0.078	0.126	-0.263	0.063
teacher behaviour talk	230	-0.142	0.000	0.000	0.000	-0.227	-0.102	0.175	0.073	-0.117	0.000
teacher social talk	240	0.000	0.000	0.000	0.195	-0.243	0.060	-0.100	0.146	0.083	-0.060
teacher praise for work	250	0.000	-0.156	**0.371**	0.000	-0.251	-0.144	0.008	-0.117	-0.193	-0.064
teacher praise for behaviour	260	0.000	-0.281	0.000	0.118	-0.022	-0.240	0.034	-0.154	-0.010	-0.025
teacher reprimand	270	-0.115	-0.266	-0.046	0.000	-0.110	-0.165	-0.157	0.165	-0.268	0.000
teacher priase for work and behaviour	250/260	0.154	**-0.594**	-0.048	0.093	-0.233	-0.198	0.033	-0.154	-0.174	-0.069
teacher reprimand and behaviour talk	270/230	-0.147	**-0.351**	-0.043	0.000	-0.231	-0.178	0.220	0.115	-0.147	0.000
student unwanted behaviour	330/305/6/7/8/340/350/360	**-0.697**	0.176	0.006	0.125	**-0.596**	**-0.422**	**-0.358**	**-0.411**	**-0.562**	**-0.685**
highlighted numbers P< 0.05 for total											
sample size (Data Points Within Samples)											

No consistent significant relationships were found between teacher verbal behaviour directed to the target student and student on-task behaviour (Table 5.1.7). Medium to large negative relationships were found between teacher task talk to the target student and student on-task behaviour, however this is not, considering relationships with other year levels, indicative of a trend. Of note is the lack of significant relationship in year level 7 and 8, in which sample size (32 sessions) is considerably greater than for other year levels.

Student on-task behaviour related significantly (medium to large relationships) and negatively to student unwanted behaviour across year levels ($p<0.05$). For years 7 and 8 ($N=32$) $r=-0.596$, $p<0.001$.

Table 5.1.8 Correlation of the Mean Rates (Seconds per Minute) of Student Unwanted Behaviour with Mean Rates of Teacher Verbal Behaviour Directed Toward the Target Student

Correlation Of Student Unwanted Behaviour	**Data Points Within Samples:**	**44**	**42**	**42**	**39**	**34**	**46**	**55**	**54**	**52**	**54**
With Teacher Behaviour Directed To The	**Sample Size:**	**N=1**	**N=2**	**N=1**	**N=2**	**N=32**	**N=5**	**N=7**	**N=3**	**N=6**	**N=3**
Target Student:	**Year Levels:**	**year 2**	**year 3**	**year 4**	**year 5&6**	**year 7&8**	**year 9**	**year 10**	**year 11**	**year 12**	**year 13**
	Behaviour Code:										
student unwanted behaviour (seconds per minute)	330/305/6/7/8/340/350/360	4.182	0.488	0.738	1.538	3.309	2.822	5.802	3.605	2.874	2.358
teacher task talk	220	-0.119	-0.087	-0.030	0.033	-0.085	-0.002	0.154	-0.086	0.279	-0.158
teacher behaviour talk	230	**0.338**	0.000	0.000	0.000	0.226	0.012	0.122	-0.016	**0.379**	0.000
teacher social talk	240	0.000	0.000	0.000	0.072	-0.170	-0.021	-0.106	0.012	-0.008	-0.072
teacher praise for work	250	0.000	-0.083	**0.338**	0.000	0.016	0.010	-0.146	0.002	0.161	0.151
teacher praise for behaviour	260	0.000	-0.075		0.099	0.155	-0.009	0.034	-0.119	0.082	0.138
teacher reprimand	270	0.031	0.041	-0.052	0.000	0.024	-0.079	0.155	-0.059	0.259	0.000
teacher praise for work and behaviour	250/260	0.000	0.143	-0.058	-0.044	0.074	0.006	-0.067	-0.102	0.177	0.104
teacher reprimand and behaviour talk	270/230	0.148	-0.005	-0.066	0.000	0.184	0.262	0.071	-0.031	0.383	-0.166
student on task behaviour	301/302/320	**-0.697**	0.176	0.006	0.125	**-0.596**	**-0.422**	**-0.358**	**-0.411**	**-0.562**	**-0.685**
highlighted numbers P< 0.05 for total											
sample size (Data Points Within Samples)											

No consistent significant relationships were found between teacher verbal behaviour directed to the target student and student unwanted or competing behaviour (Table 5.1.8). Student unwanted behaviour related significantly and negatively to student on-task behaviour across year levels 2, 7 and 8, 9, 10, 11, 12, and 13. For years 7 and 8 ($N=32$) $r=-0.596$, $p<0.001$.

Commentary Teacher verbal behaviour directed to the target student is minimal. Teacher praise for work (250) occurred between 0 and 0.823 of recorded intervals (0 and 0.063 seconds per minute), teacher praise for behaviour (260) between 0 and 0.353 of every interval (0 and 0.064 seconds per minute). Teacher reprimands (270) between 0 and 0.706 (0 and 0.182 seconds per minute) and teacher behaviour talk (230) occurred between 0 and 0.765 (0 and 0.356 seconds per minute) of recorded intervals (Table 5.1.7). Maximum occurrence was consistently the case for years 7 and 8. Praise for work was greater than praise for behaviour across year levels, both increased over year level.

The peaks in Figure 5.1.5, teacher praise for work and for behaviour, are consistent with the management of a more difficult group of students as is the case for year levels 7 and 8. The peak in Figure 5.1.6 reflects the data from one class and is likely idiosyncratic of that teacher.

The large relationships found between teacher praise for work and praise for behaviour (r=0.946), teacher reprimand and teacher behaviour talk (r=0.694) reflect a close relationship between these behaviours.

A close relationship was similarly found between teacher praise (250/260) and teacher reprimand and behaviour talk (230/270) in Figure 5.1.9 (r=0.813). The reason for this high correlation between praise to the target student for work and behaviour combined and reprimand and behaviour talk may reflect a characteristic 'offsetting' of reprimand and behaviour talk with praise by incident, and not by time.

A 'change-over' occurs between reprimand as predominant to behaviour talk after year 7 and 8.

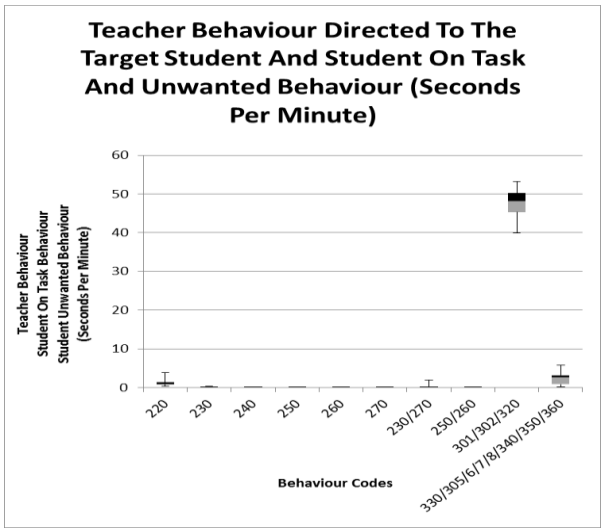
No significant relationships were found between teacher verbal behaviour directed to the target student and student on-task or unwanted behaviour.

This lack of any consistent significant relationships between any measured teacher verbal behaviour directed to the target student and student on-task or unwanted behaviour suggests factors other than these are responsible for student

behaviour. This supports the similar contention made on page 59 of the Literature Review.

b. Teacher Verbal Behaviour Directed toward the Whole Class, to the Target Student and to Other Students Combined

Figures 5.1.11 and 5.1.12 show the rates (seconds per minute) of teacher verbal behaviour to the target student and all teacher verbal behaviour combined. The predominant behaviour in both cases are teacher task talk (202/220/221), student on-task behaviour (301/302/320) and student unwanted or competing behaviour (Figure 5.1.13). The difference between the rate of teacher task talk to the target student (mean 1.205 seconds per minute) relative to all teacher task talk (mean 28.502) is substantial. These figures offer a clear illustration of the difference in the proportion of verbal behaviour that is directed to the target student relative to all teacher verbal behaviour within the classroom. All plots are compact indicating rates are consistent across records, student on-task behaviour having a greater range particularly the bottom 25% falling over a greater range, Standard errors are all small, the means are close to the medians indicating approximation to a normal distribution. Teacher task talk to the target student and teacher task talk show similar characteristics, as do Figures 5.1.13 and 5.1.14.



Mean	1.205	0.071	0.029	0.041	0.022	0.066	0.137	0.063	47.842	2.331
Standard Error	0.328	0.035	0.013	0.014	0.007	0.021	0.180	0.014	1.101	0.549

Figure 5.1.11 Mean Rates (Seconds per Minute) of Teacher Verbal Behaviour Directed to the Target Student and Student On-Task and Unwanted Behaviour – Combined Totals

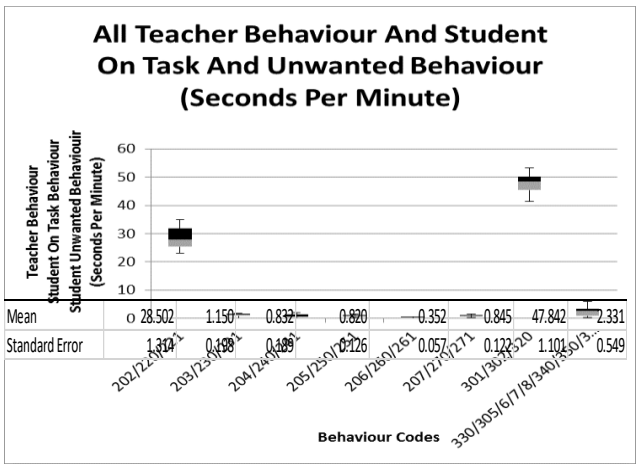
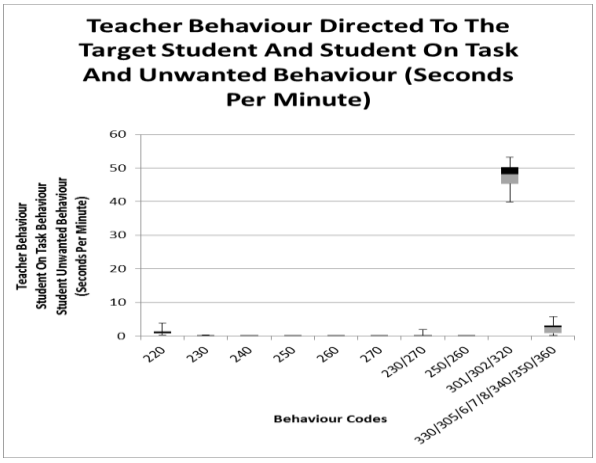
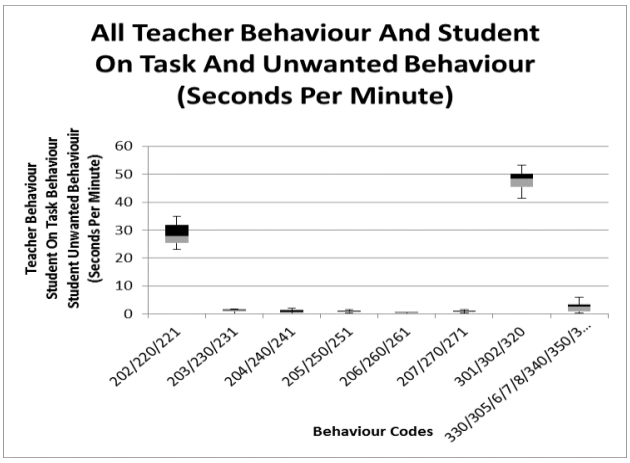


Figure 5.1.12 Mean Rates (Seconds per Minute)of All Teacher Verbal Behaviour and Student On-Task and Unwanted Behaviour – Combined Totals



Mean	1.205	0.071	0.029	0.041	0.022	0.066	0.137	0.063	47.842	2.331
Standard Error	0.328	0.035	0.013	0.014	0.007	0.021	0.180	0.014	1.101	0.549

Figure 5.1.13 Mean Rates of Teacher Verbal Behaviour Directed to the Target Student and Student On-Task and Unwanted Behaviour (Seconds per Minute – Combined Totals

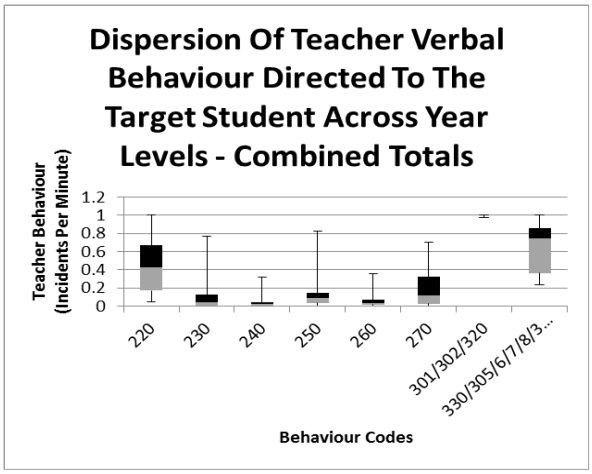


Mean	28.5	1.15	0.832	0.82	0.352	0.845	47.76	2.196
Standard Error	1.314	0.198	0.189	0.126	0.057	0.122	1.126	0.464

Figure 5.1.14 Mean Rates of All Teacher Verbal Behaviour and Student On-Task and Unwanted Behaviour (Seconds per Minute) – Combined Totals

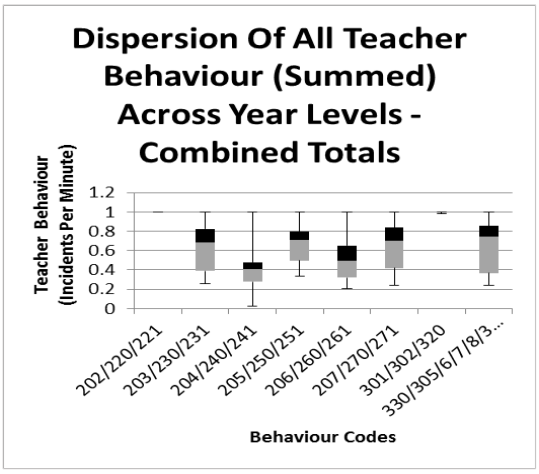
All teacher behaviour is the summation of that directed to whole class, directed to the target child and directed to other students.

For teacher behaviour directed toward the target student (Figures 5.1.10 and 5.1.13) the predominant behaviours are teacher task talk, reprimand, praise for work and behaviour talk. For all teacher behaviour combined (Figures 5.1.12 and 5.1.14), the predominant teacher behaviours are teacher task talk, reprimand and behaviour talk are approximate, and praise for work.



Mean	0.440	0.123	0.069	0.159	0.074	0.224	0.998	0.628
Standard Error	0.098	0.074	0.036	0.077	0.034	0.086	0.002	0.091

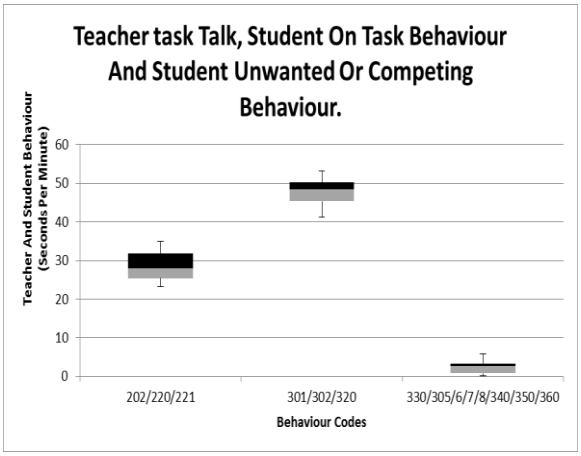
Figure 5.1.15 The Mean Rates (Incidents per Minute) of Teacher Verbal Behaviour Directed to the Target Student across Year Levels-Combined Totals



Mean	1	0.634	0.403	0.675	0.510	0.650	0.998	0.628
Standard Error	0	0.086	0.083	0.068	0.078	0.084	0.002	0.091

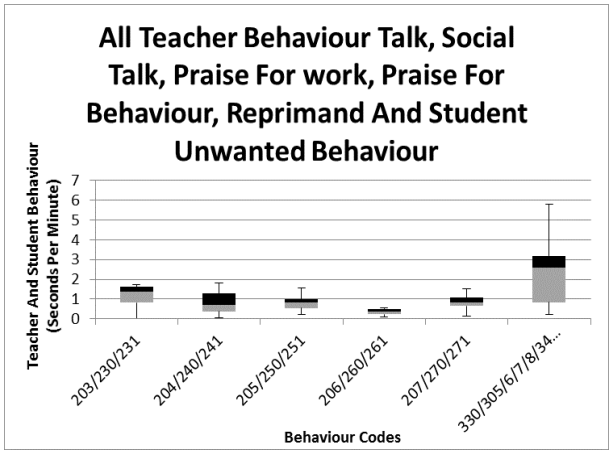
Figure 5.1.16 The Mean Rates (Incidents per Minute) of Teacher Behaviour Combined-Directed to the Whole Class, to the Target Student and to Other Students – Combined Totals

When the mean rates of occurrence (incidents per minute) are considered (Figure 5.1.15 and Figure 5.1.16), Teacher Task Talk to the Target Student and All Targets Combined respectively, Target Student on-task behaviour occurs in every interval. When all targets are combined both Teacher Task Talk and student on-task behaviour occur in every interval. Student unwanted behaviour is comparatively high (greater range) and associated with teacher reprimands (207/270/271) and behaviour talk (equivalent means and medians, low standard errors). The next highest teacher verbal behaviour is teacher social talk (204/240/241). This data is expanded in Tables 5.1.10, and 5.1.11, and shows the incidents per minute and rate (seconds per minute) of the combined data having similar characteristics.



Mean	28.502	47.760	2.196
Standard Error	1.314	1.126	0.464

Figure 5.1.17 Mean Rates of Teacher Task Talk Combined, Student On-Task Behaviour and Student Unwanted Behaviour (Seconds per Minute) – Combined Totals



Mean	1.150	0.832	0.820	0.352	0.845	2.331
Standard Error	0.198	0.189	0.126	0.057	0.122	0.549

Figure 5.1.18 Mean Rates of All Teacher Behaviour Talk, Social talk, Praise for Work, Praise for Behaviour, Reprimands and Student Unwanted Behaviour (Seconds per Minute) – Combined Totals

The box plot data is replicated in Table 5.1.11, showing means, medians, ranges and standard deviations for the respective behaviour.

Table 5.1.9 Mean Rates of All Teacher Behaviour Combined (Incidents per Minute), Across Year Levels

						Year Level:					
Teacher And Student Behaviour		**Year 2**	**Year 3**	**Year 4**	**Year 5 & 6**	**Year 7 & 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**
(Incidents Per Minute):	**Behaviour Code:**					**Incidents Per Minute:**					
teacher task talk	202/220/221	1	1	1	1	1	1	1	1	1	1
teacher behaviour talk	203/230/231	0.409	0.690	0.333	0.385	1	0.848	0.982	0.685	0.750	0.259
teacher social talk	204/240/241	0.023	0.333	0.259	0.513	1	0.391	0.491	0.148	0.442	0.426
all teacher praise for work	205/250/251	0.523	0.762	0.481	0.487	1	0.783	0.927	0.796	0.654	0.333
all teacher praise for behaviour	206/260/261	0.318	0.690	0.296	0.538	1	0.326	0.745	0.444	0.538	0.204
all teacher reprimands	207/270/271	0.341	0.595	0.370	0.564	1	0.804	0.927	0.815	0.846	0.241
all teacher praise for work and behaviour	205/250/251/206/260/261	0.636	0.881	0.593	0.744	1	0.891	0.964	0.815	0.788	0.463
teacher reprimands and behaviour talk	203/230/231/207/270/271	0.545	0.833	0.444	0.641	1	0.935	0.982	0.926	0.885	0.315
student on task	301/302/320	0.977	1	1	1	1	1	1	1	1	1
student unwanted or competing behaviour	330/305/6/7/8/340/350/360	0.386	0.238	0.259	0.359	1	0.783	1	0.870	0.808	0.704

Table 5.1.10 Mean Rates of All Teacher Behaviour Combined (Seconds per Minute), Across Year Levels

						Year Level:					
Teacher And Student Behaviour		**Year 2**	**Year 3**	**Year 4**	**Year 5 & 6**	**Year 7 & 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**
(Seconds Per Minute):	**Behaviour Code:**					**Seconds Per Minute:**					
teacher task talk	202/220/221	30.500	23.143	24.810	23.231	27.472	35.032	28.419	27.019	33.013	32.386
teacher behaviour talk	203/230/231	1.750	1.643	0.762	1.038	1.607	1.483	1.714	1.444	1.249	0.265
teacher social talk	204/240/241	0.045	0.357	1.833	0.564	1.422	0.935	0.391	0.389	0.807	1.580
all teacher praise for work	205/250/251	1.273	0.917	0.476	0.705	1.025	0.586	0.919	1.546	0.528	0.225
all teacher praise for behaviour	206/260/261	0.568	0.560	0.214	0.538	0.343	0.100	0.434	0.398	0.277	0.093
all teacher reprimands	207/270/271	0.659	1.071	0.643	0.500	0.871	0.820	1.188	1.512	1.038	0.148
all teacher praise for work and behaviour	205/250/251/206/260/261	1.841	1.476	0.690	1.244	1.368	0.686	1.353	1.944	0.805	0.318
teacher reprimands and behaviour talk	203/230/231/207/270/271	2.409	2.714	1.393	1.538	2.478	2.302	2.903	2.957	2.288	0.414
student on task	301/302/320	45.182	52.607	50.452	53.410	47.284	52.807	48.106	41.318	45.771	48.907
student unwanted or competing behaviour	330/305/6/7/8/340/350/360	4.182	0.488	0.738	1.115	3.309	2.822	5.802	3.605	2.874	2.358

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Table 5.1.11Mean, Median Range and Standard Deviations for the Mean Rates (Incidents and Seconds per Minute) of Behaviour Relating to Table 5.1.10

Dispersion Across Intervals.						
Behaviour:	**Code:**	**Mean**	**Median**	**Range**	**Standard Deviation**	
teacher task talk	202/220/221	1	1	0	0	
teacher behaviour talk	203/230/231	0.634	0.688	0.741	0.272	
teacher social talk	204/240/241	0.403	0.409	0.977	0.261	
all teacher praise for work	205/250/251	0.675	0.708	0.667	0.215	
all teacher praise for behaviour	206/260/261	0.510	0.491	0.796	0.246	
all teacher reprimands	207/270/271	0.650	0.700	0.759	0.267	
student on task behaviour	301/302/320	0.998	1	0.023	0.007	
student unwanted or competing behaviour	330/305/6/7/8/340/350/360	0.628	0.74	0.762	0.286	
Duration Across Intervals (Seconds):						
Behaviour:	**Code:**	**Mean**	**Median**	**Range**	**Standard Deviation**	
teacher task talk	202/220/221	28.502	27.945	11.889	4.156	
teacher behaviour talk	203/230/231	1.150	1.366	1.750	0.626	
teacher social talk	204/240/241	0.832	0.686	1.788	0.599	
praise work	205/250/251	0.820	0.811	1.321	0.397	
praise behaviour	206/260/261	0.352	0.370	0.476	0.179	
reprimands	207/270/271	0.845	0.845	1.364	0.385	
student on task behaviour	301/302/320	47.760	48.507	11.964	3.560	
student unwanted or competing behaviour	330/305/6/7/8/340/350/360	2.196	2.590	4.244	1.466	

The equivalence of mean and median indicate normal distributions across all combined behaviour (incidence and seconds per minute). Teacher praise for work occurred in slightly more than half of intervals (mean=0.675), praise for behaviour in slightly less (mean=0.510) as were teacher reprimands (mean=0.510). None could be considered pervasive in nature. In contrast student on-task behaviour occurred in all intervals (mean 0.998 and 47.760 seconds per minute).

The greater dispersion is apparent in years 7 and 8 (Table 5.1.6 and 5.1.11). Teacher praise for work (mean of 0.82 seconds per minute), teacher praise for behaviour (mean=0.352) and teacher reprimands (mean of 0.845) occurred within 0.675, 0.510 and 0.650 of recorded intervals respectively. Not only was the duration (seconds per minute) of this behaviour low (data represents the sum of all teacher praise for work and behaviour, social talk,behaviour talk and reprimands i.e. to the target student, other students and the whole class), dispersion across intervals was not pervasive. The dispersion and duration of teacher reprimands and praise for work were quite similar, albeit reprimands slightly less than praise.

Figures 5.1.19 and 5.1.20 show the sum of all teacher praise for work, praise for behaviour and reprimands (incidents and seconds per minute).

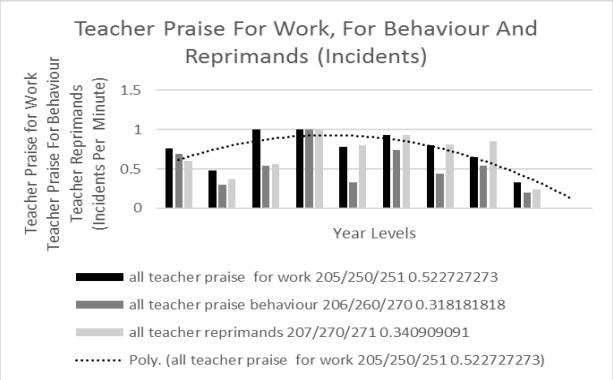

Figure 5.1.19 Mean Occurrence of Teacher Praise for Work, for Behaviour, Reprimands and Student On-Task Behaviour (Incidents per Minute), Across Year Levels

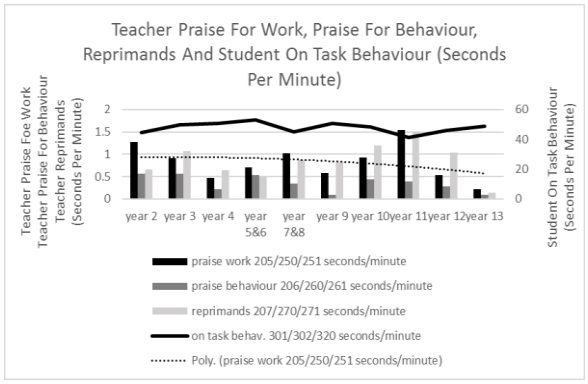

Figure 5.1.20 Mean Occurrence Teacher Praise for Work, for Behaviour, Reprimands and Student On-Task Behaviour (Seconds per Minute) Across Year Levels

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The incidence of all teacher praise across year levels is greater over the middle year levels, as is evidenced by the polynomial trend line (Figure 5.1.19), however this is not reflected in the relative duration (seconds per minute) of behaviour (Figure 5.1.20). It does not appear there are any further substantive patterns to be found in these results (Figures 5.1.19 and 5.1.20) even when all student on-task behaviour is included, be it by incidence or duration of occurrence per 60 second interval. In Figure 5.1.19 student on-task behaviour occurred in almost every interval. Student on-task behaviour shows no obvious relationship with teacher praise for work, praise for behaviour or reprimands. Sample size is such, however that any variation in respective scores albeit minimal, aside from year levels 7 and 8, and 10 may reflect specific teacher idiosyncrasy.

Commentary The difference between the rate of teacher task talk to the target student (mean 1.205 seconds per minute) relative to all teacher task talk (mean 28.502) is substantial. Figures 5.1.10 and 5.1.12 offer a clear illustration of the difference in the proportion of verbal behaviour that is directed to the target student relative to all teacher verbal behaviour within the classroom.

It is this, plus the relative dispersion of that behaviour (Figures 5.1.13 and 5.1.14) that necessarily defines and reflects the class ambience.

The greater dispersion or occurrence across all teacher verbal behaviour is apparent in years 7 and 8 (Table 5.1.6 and 5.1.11) is consistent with the teacher-expressed greater difficulty in the management of this age band.

The incidence of all teacher praise across year levels is greater over the middle year levels, as is evidenced by the polynomial trend line (Figure 5.1.19), however this is not reflected in the relative duration (seconds per minute) of the same behaviour (Figure 5.1.20). Student on-task behaviour shows no obvious relationship with teacher praise for work, praise for behaviour or reprimands. Sample size is such, however that any variation in respective scores albeit minimal, aside from year levels 7 and 8, and 10 may reflect specific teacher idiosyncrasy.

Teacher Praise, Reprimand and Behaviour Talk

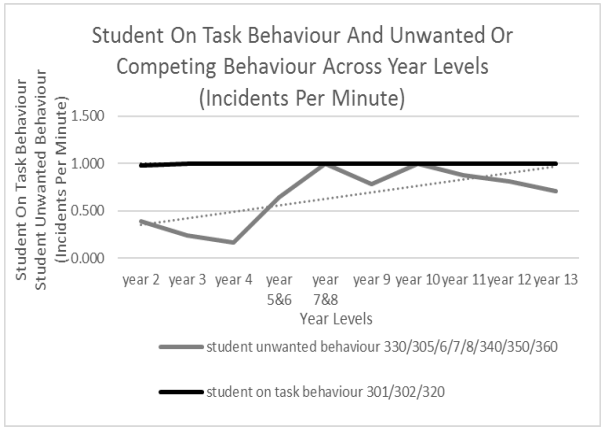
Teacher praise combined (praise for work and behaviour) ranges from 0.462 incidents per minute to 1 in year 7 and 8. This corresponds with a rate of 0.318 to 1.840 seconds per minute in year 2. All teacher reprimand and behaviour talk 0.315 incidents per minute to 1 for year 7 and 8, and a rate of 0.414 to 2.957 seconds per minute in year 11 respectively.

Year level 7 and 8 was greatest in respect to incidents per minute of all teacher praise and reprimand and behaviour talk although this did not correspond with seconds per minute of the respective behaviour (Tables 5.1.10 and 5.1.11).

For both combined behaviours, year 7 and 8 scores (all praise 1.368, all reprimands 2.478 seconds per minute) were greater than both the mean and median of the combined data (Table 5.1.14).

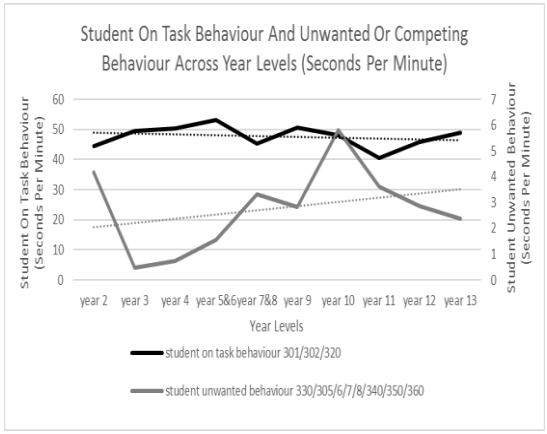
Table 5.1.12 All Teacher Praise, Reprimands and Behaviour Talk, Mean Occurrence (Incidents and Seconds per Minute) Across Year Levels

Dispersion Across Intervals (Incidents Per Minute)					
Behaviour:	**Code:**	**Mean**	**Median**	**Range**	**Standard Deviation**
all teacher praise for work and behaviour	205/250/251/206/260/261	0.777	0.802	0.537	0.054
all teacher reprimand and behaviour talk	203/230/231/207/270/271	0.751	0.859	0.685	0.078
Rate Across Intervals (Seconds Per Minute)					
Behaviour:	**Code:**	**Mean**	**Median**	**Range**	**Standard Deviation**
all teacher praise for work and behaviour	205/250/251/206/260/261	1.173	1.298	1.627	0.532
all teacher reprimand and behaviour talk	203/230/231/207/270/271	2.140	2.356	2.543	0.797



r =	0.32

Figure 5.1.21 Student On-Task Behaviour and Unwanted Behaviour Mean Occurrence (Incidents per Minute), Across Year Levels



r =	-0.52

Figure 5.1.22 Student On-Task Behaviour and Unwanted Behaviour across Year Levels), Mean Occurrence (Seconds per Minute), Across Year Levels

Student on-task behaviour (incidents per minute) is stable across year levels (Figure 5.1.19), student unwanted or competing behaviour decreases until year 4, increases until years 7 and 8, remaining relatively stable to year 10 and decreasing after year 10. The overall trend indicates an increase over year levels. The rate (seconds per minute) for student on-task behaviour decreases over year levels (Figure 5.1.20 trend line), student unwanted behaviour decreases from year 2 to 3 and increases until year 10, when, like incidents per minute, it decreases. Student unwanted or competing behaviour is largely constituted of student social talk to other students (Table 5.1.13). The two figures (5.1.19 and 5.1.20) depict a different view of the recorded behaviour, Figure 5.1.20 (seconds per minute) clearly depicting an inverse relationship between the two variables.

Table 5.1.13 Mean Occurrence Across Year Levels of Student Social talk as a percentage of mean rates of Student Unwanted Behaviour (Seconds per Minute)

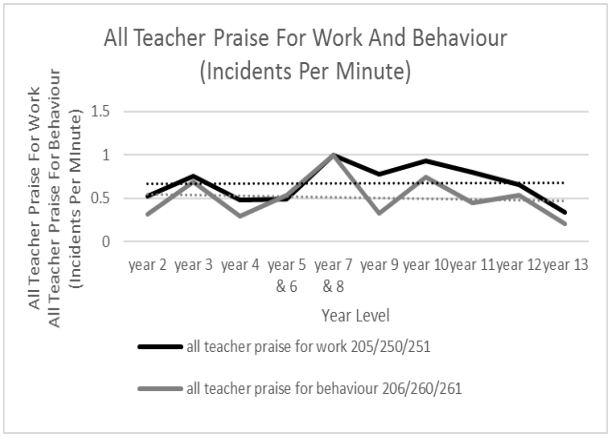
Student Social Talk As A Percentage Of	**Data Points Within Samples:**	**44**	**42**	**42**	**39**	**34**	**46**	**55**	**54**	**52**	**54**
Student Unwanted or Competing Behaviour	**Sample Size:**	**N=1**	**N=2**	**N=1**	**N=2**	**N=32**	**N=5**	**N=7**	**N=3**	**N=6**	**N=3**
(Seconds Per Minute)	**Year Level:**	**Year 2**	**Year 3**	**Year 4**	**Year 5 & 6**	**Year 7 & 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**
student social talk to other students	330	3.977	0.357	0.738	0.564	2.758	2.283	3.870	3.235	2.608	2.296
student unwanted behaviour	330/305/6/7/8/340/350/360	4.182	0.488	0.738	1.538	3.309	2.822	5.802	3.605	2.874	2.358
percentage social talk to unwanted behaviour		95.109	73.171	100.000	36.667	83.368	80.894	66.705	89.726	90.743	97.382

Table 5.1.13 shows the percentage of student unwanted behaviour that is attributable to social talk to other students and that which is attributable to more extreme disruptive behaviour. Year 5 and 6 evidences a greater percentage of extreme behaviour although the total of unwanted behaviour is the third lowest. In

contrast year 10 has the highest rate of student unwanted behaviour (5.802 seconds per minute) and the greatest percentage of extreme behaviour.

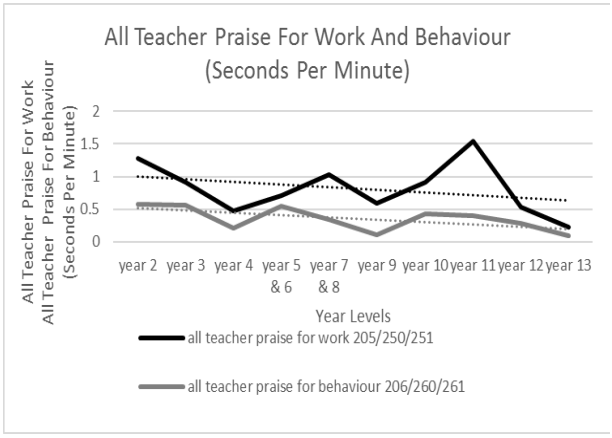
That teacher social talk to the class, target student and other students combined constitutes the fourth highest teacher behaviour (seconds per minute) implies that it is not entirely an unwanted behaviour (mean 0.832 seconds per minute, Table 5.1.12).

Teacher Praise



r =	0.79

Figure 5.1.23 All Teacher Praise for Work and Praise for Behaviour Differentiated (Incidents per Minute), Mean Occurrence Across Year Levels



r =	0.654

Figure 5.1.24 All Teacher Praise for Work and Praise for Behaviour Differentiated (Seconds per Minute), Mean Duration Across Year Levels

All teacher praise for work and behaviour show an increase in incidence (Figure 5.1.23) in year 7 and 8 and then a decrease over year level from year 10. Overall, teacher praise for work shows a minimal increase over year level, praise for behaviour a marginal decrease (Figure 5.1.23). Both all teacher praise for work and behaviour show a decrease over year level for rate (seconds per minute) of praise for work and behaviour (Figure 5.1.24). From year 7 and 8 on incidents per minute of all teacher praise for work exceeds praise for behaviour (Figure 5.1.23), prior to this, incidents per minute are approximate. For rate (seconds per minute, Figure 5.1.24) all teacher praise for work exceeds all teacher praise for behaviour across all year levels.

By comparison, Figures 5.1.5 and 5.1.6 show increases in the occurrence of both praise for work and behaviour at year 7 and 8 after which the incidence of the two become almost equivalent across year levels for teacher behaviour directed toward the target student. This data showed that both incidence and rate (seconds per minute) indicated minimal praise for behaviour overall particularly in the junior classes relative to the senior classes. The trend lines indicated both praise for work and praise for behaviour increasing over year level albeit the incidence and rate relating to the target student are minimal. The distinction found in Figures 5.1.5 and 5.1.6 regarding the distinction between earlier and later year levels is not as clearly differentiated when all teacher praise is combined (Figures 5.1.23 and 5.1.24).

Table 5.1.14 The Mean Rates (Seconds per Minute) of Teacher Praise for Work and Behaviour, Severally and Combined, directed to the Target Student and the Percentage of Praise Directed to the Target Student Relative to all Teacher Praise

Teacher Praise For Work And Behaviour:				
praise for work and behaviour to the targets student	Behaviour Code:	250	260	250/260
	mean:	0.041	0.0216	0.063
all teacher praise to class, target student, others	Behaviour Code:	205/250/251	206/260/261	205/50/51/206/60/61
	mean:	0.82	0.352	1.172
praise to target student as percentage of all praise	percentage:	5	6.136	5.375

Teacher praise for work to the target student constituted 5 percent of all teacher praise for work 205/250/251). Teacher praise for behaviour to the target student was 6.136 of all teacher praise for behaviour (206/260/261). All teacher praise to the target student was 5.375 percent of all teacher praise.

Commentary The greater percentage of student unwanted behaviour across year levels is student social talk (range 36-100%) to other students rather than more extreme disruptive behaviour (Table 5.1.15). Teacher social talk to the class, target student and other students combined constitutes the fourth highest teacher behaviour (seconds per minute). This, despite that it can be described as proactive teacher distraction from task, necessarily implies that it is not entirely an unwanted behaviour (mean 0.832 seconds per minute, Table 5.1.12).

The results shown in Table 5.1.16 further emphasise the paucity of teacher praise within the classroom be it individually targeted or class wide, differentiated in to praise for work or behaviour, or combined. The rates reflect the lack of

significant correlation between praise and student on-task and unwanted behaviour directed either to the individual student (Table 5.1.9) or class wide (Tables 5.1.18 and 5.1.19).

Teacher Reprimand and Behaviour Talk

Figure 5.1.25 shows an increase in incidence of both reprimand and behaviour talk from year 7 and 8 on, both trend lines increase over year level. Figure 5.1.26 reflects the profile in Figure 5.1.14 although trend lines indicate the rate (seconds per minute) of behaviour talk decreases over year level, that of reprimand increases.

For teacher reprimand and behaviour talk to the target student (Figures 5.1.7 and 5.1.8), reprimand decreases over year level in both incidence and rate (seconds per minute) teacher, teacher behaviour talk increases for both more so from year level 7 and 8. The large relationship obtained between all teacher reprimand and all teacher behaviour talk (r= 0.942) reflects the correlation obtained for the same teacher behaviour directed to the target student (Figure 5.1.7, r= 0.694). This indicates that the two variables are interrelated be it when directed individually or to all students combined.

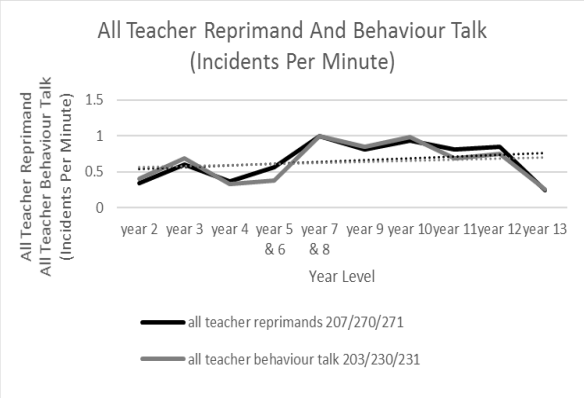
Table 5.1.17 shows the mean of teacher reprimand and behaviour talk severally and combined for the target student and all teacher reprimand and behaviour talk combined, plus the percentage of praise directed to the target student relative to all teacher praise.

Table 5.1.15 The Mean Rates (Seconds per Minute) of Teacher Reprimand and Behaviour talk, Severally and Combined, Directed to the Target Student and all Teacher Reprimand and Behaviour Talk and the Percentage of Reprimand and Behaviour Talk Directed to the Target Student Relative to all Teacher Reprimand and Behaviour talk

Teacher Reprimand And Behaviour Talk:	Behaviour Code:	230	270	230/270
reprimand and behaviour talk to the target student	mean:	0.071	0.066	0.137
	Behaviour Code:	203/230,	207/270,	203/30/31/207/70/71
all teacher reprimand and behaviour talk	mean:	1.15	0.845	1.995
	percentage:	6.174	7.81	6.887

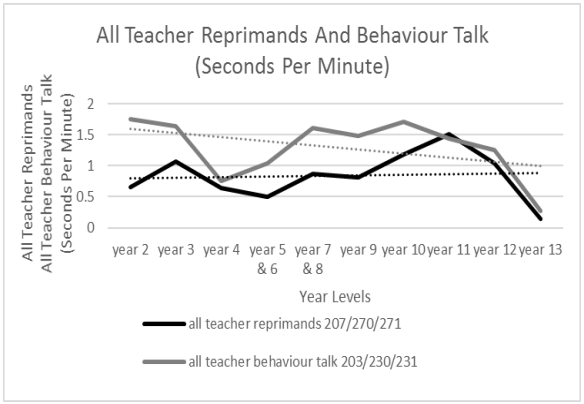
Teacher behaviour talk to the target student (230) was 6.174 percent of all teacher behaviour talk (203/230/231). Teacher reprimand (270) was 7.81 percent of all teacher reprimands. Teacher reprimand and behaviour talk to the target student was 6.887 percent of all teacher reprimand and behaviour talk.

All teacher praise to the target student was 5.375 percent of all teacher praise (mean 1.172). Teacher reprimand and behaviour talk to the target student (230/270)



r =	0.942

Figure 5.1.25 All Teacher Reprimand and Behaviour Talk Differentiated (Incidents per Minute), Mean Rates Across Year Levels



r =	0.69

Figure 5.1.26 All Teacher Reprimand and Behaviour Talk Differentiated (Seconds per Minute), Mean Rates Across Year Levels

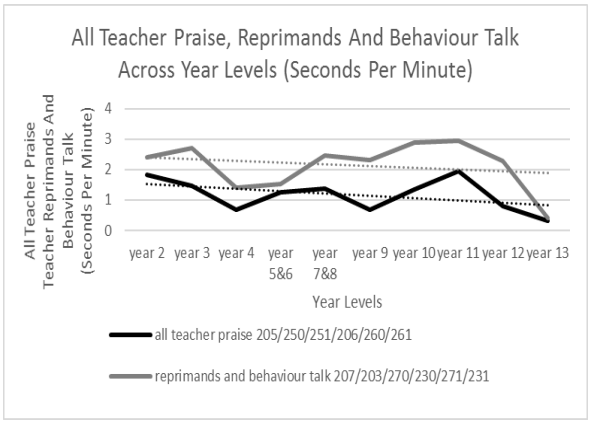
was 2.175 times greater than teacher praise to the target student (250/260). All teacher reprimand and behaviour talk was 1.702 times greater than all teacher praise for work and behaviour combined.

Figures 5.1.27 and 5.1.28 show teacher praise for work and behaviour, and reprimands and behaviour talk to the target student combined for both occurrence (incidents per minute) and rate (seconds per minute).

For the junior classes (incidents per minute), all teacher praise exceeds reprimands and behaviour talk, after year 7 and 8 the total of teacher reprimand and behaviour talk exceeds all teacher praise. The incidence of all teacher praise decreases over year levels, teacher reprimand and behaviour talk increases.

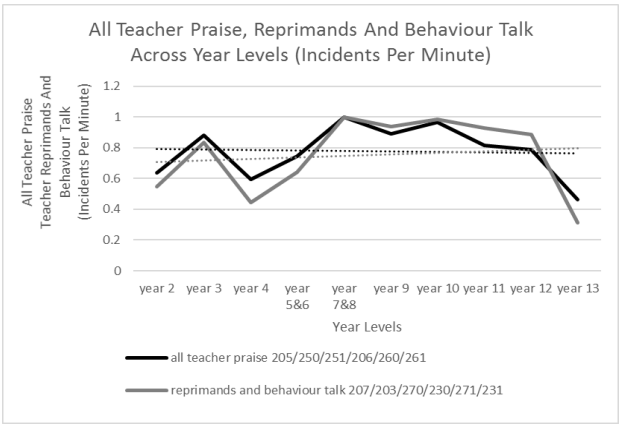
When the rate (seconds per minute) is considered, teacher reprimands and behaviour talk exceeds all teacher praise over all year levels, both decrease over year levels.

For the junior classes, praise directed toward the target student (250/260) overall exceeds reprimands and behaviour talk to the target student (incidents per minute and seconds per minute), for years 7 and 8 onwards this is reversed (Figures 5.1.9 and 5.1.10). When all teacher praise and reprimand and behaviour talk are combined, reprimand and behaviour talk exceed praise over all year levels. This deviation is more manifest from year 7 and 8 onward until year 13 when the two measures coinicide.



r = 0.747

Figure 5.1.27 All Teacher Praise, Reprimands and Behaviour Talk across Year Levels (Seconds per Minute,) Mean Occurrence Across Year Levels



r =	0.958

Figure 5.1.28 All Teacher Praise, Reprimands and Behaviour Talk across Year Levels (Incidents per Minute), Mean Occurrence Across Year Levels

The above results are consistent with the transition between a student focus and whole class focus previously noted regarding teacher task talk (Figure 5.1.3, 5.1.27). The trend lines indicate that the incidence of teacher praise to the target student increases over year levels, reprimands and behaviour talk decreases. When time is considered, both measures increase over year levels, reprimand and behaviour talk to the target student at a greater rate.

The large relationship obtained between all teacher praise and reprimand and behaviour talk combined (Figure 5.1.27, r= 0.958) reflects the relationship

obtained for teacher behaviour directed to the target student (Figure 5.1.9, r= 0.869) in respect to incidents per minute.

Significant negative correlations were found between student on-task behaviour and student unwanted or competing behaviour for seven of the ten year levels. This is as would be expected.

Commentary When teacher reprimand and behaviour talk are differentiated the incidence of the two are equivalent and increasing. When graphed by seconds per minute, behaviour talk exceeds reprimand across all year levels. Trend lines indicate a reduction in behaviour talk and increase in reprimand.

For the junior classes (incidents per minute), all teacher praise exceeds reprimands and behaviour talk, after year 7 and 8 the total of teacher reprimand and behaviour talk exceeds all teacher praise. The incidence of all teacher praise decreases over year levels, teacher reprimand and behaviour talk increases. When the rate (seconds per minute) is considered, teacher reprimands and behaviour talk exceeds all teacher praise over all year levels, both decrease over year levels.

The high correlation between all teacher praise and teacher reprimand and behaviour talk combined may reflect a characteristic 'offsetting' of reprimand and behaviour talk with praise by incident, and not by time.

Table 5.1.16 Mean Occurrence (Seconds per Minute) Across Year Levels of Teacher Verbal Behaviour and Student On-Task Behaviour, Combined Totals, Correlations and Confidence Levels

Correlation Of Teacher Behaviour With	**Data Points Within Samples:**		**44**	**42**	**42**	**39**	**34**	**46**	**55**	**54**	**52**	**54**
Student On Task Behaviour:		**Sample Size:**	**N=1**	**N=2**	**N=1**	**N=2**	**N=32**	**N=5**	**N=7**	**N=3**	**N=6**	**N=3**
	Behaviour Code:	**Year Levels:**	**year 2**	**year 3**	**year 4**	**year 5&6**	**year 7&8**	**year 9**	**year 10**	**year 11**	**year 12**	**year 13**
student on task behaviour	301/302/320	seconds/minute	44.364	49.560	50.452	53.282	47.284	50.626	48.106	41.318	45.771	48.907
teacher task talk	202/220/221		-0.136	**0.454**	**0.873**	0.096	**0.384**	**0.424**	**0.590**	-0.217	-0.292	**0.339**
teacher behaviour talk	203/230/231		0.186	0.181	0.004	-0.139	-0.067	0.070	0.147	-0.051	-0.081	0.033
teacher social talk	204/240/241		0.112	0.128	0.184	-0.008	-0.015	0.030	-0.130	0.104	-0.139	-0.266
teacher praise for work	205/250/251		0.033	0.063	0.277	-0.160	-0.164	-0.134	0.215	-0.036	**-0.350**	0.055
teacher praise for behaviour	206/260/261		0.234	0.142	0.109	-0.011	-0.009	-0.018	0.112	-0.027	-0.068	0.006
teacher reprimand	207/270/271		-0.142	0.079	-0.234	-0.079	-0.269	-0.175	-0.113	0.135	-0.088	-0.002
teacher praise for work and behaviour	205/250/251/206/260/261		0.154	**0.350**	0.112	**-0.469**	-0.158	-0.126	0.238	-0.040	**-0.305**	0.054
teacher reprimand and behaviour talk	207/203/270/230/271/231		0.136	**-0.351**	0.241	0.077	-0.143	-0.005	0.050	0.050	-0.100	0.027
student unwanted behaviour	330/305/6/7/8/340/350/360		**-0.697**	0.176	0.006	0.125	**-0.596**	**-0.422**	**-0.358**	**-0.411**	**-0.562**	**-0.685**
highlighted numbers P< 0.05 for total												
sample size (Data Points Within Samples)												

No significant positive relationships were found across year levels for either teacher praise or teacher reprimands and student on-task behaviour that would indicate a characteristic significant relationship exists (Table 5.1.16). Combining

teacher reprimands and behaviour talk rendered no significant positive correlations with either student on-task behaviour or with the total of student unwanted or competing behaviour (304/05/06/07/08/330/40/50/60).

Moderate to large positive relationships were found between student on-task behaviour and all teacher task talk (202/220/221) for years 3, 4, 7 and 8, 9, 10, and 13 ($p<0.05$). For year 7 and 8 r0.384, $p< 0.05$) when this is calculated by total number of sessions.

Moderate to large negative relationships were found between student on-task behaviour and student unwanted or competing behaviour for seven of the ten year levels.

Table 5.1.17 Correlation of Mean Rates of Student Unwanted Behaviour with Mean Rates of Combined Totals of Teacher Verbal Behaviour(Seconds per Minute) Across Year Levels

Correlation Of Teacher Behaviour With	**Data Points Within Samples:**		**44**	**42**	**42**	**39**	**34**	**46**	**55**	**54**	**52**	**54**
Student Unwanted Or Competing Behaviour:		**Sample Size:**	**N=1**	**N=2**	**N=1**	**N=2**	**N=32**	**N=5**	**N=7**	**N=3**	**N=6**	**N=3**
		Year Levels:	**year 2**	**year 3**	**year 4**	**year 5&6**	**year 7&8**	**year 9**	**year 10**	**year 11**	**year 12**	**year 13**
	Behaviour Code:											
student unwanted behaviour	330/305/6/7/8/340/350/360	seconds/minute	4.182	0.488	0.738	1.538	3.309	2.822	5.802	3.605	2.874	2.358
teacher task talk	202/2201/221		0.278	0.032	0.120	**-0.349**	**-0.358**	**-0.316**	0.018	0.169	0.267	-0.195
teacher behaviour talk	203/230/231		-0.143	0.140	-0.075	**0.951**	0.172	0.224	-0.002	-0.056	**0.328**	-0.147
teacher social talk	204/240/241		-0.099	-0.099	-0.023	**0.530**	**-0.316**	**0.370**	**0.357**	-0.117	0.157	**0.310**
teacher praise for work	205/250/251		0.100	-0.097	0.185	-0.187	0.013	0.122	0.027	-0.072	**0.312**	0.022
teacher praise for behaviour	206/260/261		-0.172	0.068	-0.015	0.037	-0.044	0.033	-0.122	-0.228	0.262	0.078
teacher reprimand	207/270/271		-0.110	-0.004	0.022	0.275	-0.008	0.027	0.217	-0.022	0.232	0.280
teacher praise for work and behaviour	205/250/251/206/260/261		-0.004	-0.161	0.100	-0.097	-0.007	0.119	-0.053	-0.143	**0.373**	0.055
teacher reprimand and behaviour talk	207/203/270/230/271/231		-0.165	0.105	-0.066	**0.972**	0.151	0.204	0.127	-0.059	**0.352**	-0.017
student on task behaviour	301/302/320		**-0.697**	0.176	0.006	0.125	**-0.596**	**-0.422**	**-0.358**	**-0.411**	**-0.562**	**-0.685**
highlighted numbers P< 0.05 for total												
sample size (Data Points Within Samples)												

Table 5.1.17 shows the correlation of teacher verbal behaviour combined (to the class, to the target student and to other students) with student unwanted or competing behaviour. Consistent moderate to large negative relationships were found between all teacher task talk and student unwanted behaviour (year 7 and 8, $r=-0.358$, $p<0.05$) for year levels 5 and 6, 7 and 8, and 9 ($p<0.05$). For year levels 5 and 6, teacher behaviour talk, and for level 12 reprimand and behaviour talk, related significantly (large and moderate relationships) with student unwanted behaviour.

In contrast, Tables 5.1.8 and 5.1.9 showing the correlation of teacher behaviour to the target student for student on-task and unwanted behaviour, show a lack of any consistent significant relationships between any measured teacher behaviour directed to the target student and student on-task or unwanted behaviour.

Commentary Teacher verbal behaviour to the target student was not significantly related to student on-task or unwanted behaviour (Tables 5.1.8 and 5.1.9). These results question the utility of an individual behaviour-subsequent event focus within the classroom. In contrast, over most year levels positive significant relationships were found between teacher task talk combined (to the whole class, to the target student and to other students) and student on-task behaviour and negative relationships with student unwanted behaviour.

Given the variability of result and small sample size, the trend can be seen as indicative.

Teacher Proximity (201) to the Target Student

Teacher proximity to the target student was marked in year levels 2 to 5 and 6, ranging from 9.286 seconds per minute to 20.321 seconds per minute. For subsequent year levels the range was from 2.547 seconds per minute to 10.630 (Table 5.1.18).

Table 5.1.18 Mean Occurrence (Incidents and Seconds per Minute) of Teacher Proximity to the Target Student across Year levels

						Year Level:					
Teacher Proximity To The Target Student (201):	**Behaviour Code:**	**year 2**	**year 3**	**year 4**	**year 5 & 6**	**year 7 & 8**	**year 9**	**year 10**	**year 11**	**year 12**	**year 13**
teacher proximity to the target student	incidents per minute, 201	0.273	0.786	0.452	0.692	0.971	0.478	0.727	0.352	0.865	0.519
teacher proximity to the target student	seconds per minute, 201	14.045	20.321	9.286	21.410	9.509	2.457	4.321	3.309	8.592	10.630

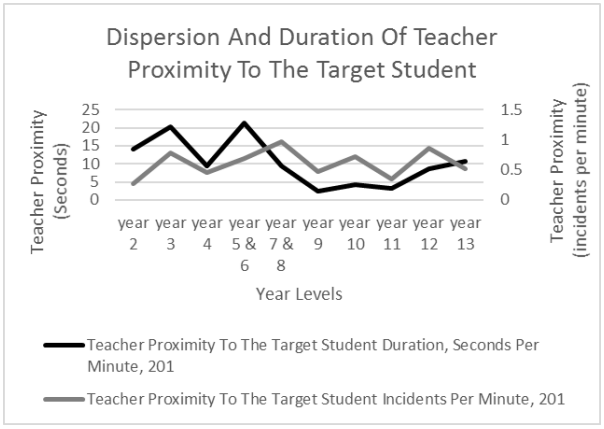


Figure 5.1.29 Mean Rates of Teacher Proximity to the Target Student, (Incidents per Minute and Seconds per Minute) Across Year Levels

Teacher proximity to the target student shows a marked decrease (seconds per minute) in year 7 and 8 which continued in subsequent year levels (Table 5.1.18, Figure 5.1.29). This transition reflects the previously mentioned change in teacher task talk from student orientated to the whole class orientation at the same year level (page 5) and change from reprimand predominant to behaviour talk predominant consequences. This reduction is not reflected in incidents per minute which show an increase for year level 7 and 8.

The dispersion (incidents per minute) across intervals is quite stable even given the reduction in time (seconds per minute), the range being from 0.273 to 0.970 incidents per minute.

Correlations (Table 5.1.19) between teacher proximity to the target student (201) and teacher task talk to the target student (220) were elevated (small to moderate relationships) across all but one year level (year 4).

Table 5.1.19 Correlation of the Mean Rates (Seconds per Minute) of Teacher Proximity to the Target Student with Teacher Behaviour Directed Toward the Target Student and Mean Student On-Task and Unwanted Behaviour Across Year Levels

Correlation Of Teacher Proximity To The											
Target Student With Teacher Behaviour To	**Data Points Within Samples:**	**44**	**42**	**42**	**39**	**34**	**46**	**55**	**54**	**52**	**54**
The Target Student And Student On Task And	95% confidence levels for 220	0.05	0.1		0.05		0.001		0.01	0.05	0.001
Unwanted Behaviour.	**Sample Size:**	**N=1**	**N=2**	**N=1**	**N=2**	**N=32**	**N=5**	**N=7**	**N=3**	**N=6**	**N=3**
Behaviour:	**Behaviour Code:**	**year 2**	**year 3**	**year 4**	**year 5 & 6**	**year 7 & 8**	**year 9**	**year 10**	**year 11**	**year 12**	**year 13**
teacher task talk to target student	220	**0.343**	0.292	0.094	**0.362**	0.262	**0.601**	0.274	**0.367**	**0.308**	**0.640**
teacher behaviour talk to target student	230	-0.040	0.000	0.000	0.000	-0.262	-0.125	-0.043	0.088	0.220	0.000
teacher social talk to target student	240	0.000	0.000	0.000	0.119	0.086	-0.121	0.000	0.107	0.072	0.056
teacher praises work of target student	250	0.000	0.210	0.091	0.000	0.089	0.150	**0.280**	0.012	0.093	0.207
teacher praises behaviour of target student	260	0.000	0.269	0.000	-0.012	0.109	0.046	0.168	0.032	0.040	0.109
teacher reprimands target student	270	0.000	-0.122	0.080	0.000	0.028	-0.102	0.068	0.206	0.103	0.000
teacher praise for work and behaviour	250/260	0.000	0.265	0.091	-0.012	0.121	0.142	0.313	0.024	0.098	0.235
teacher reprimand and behaviour talk	230/270	-0.015	-0.122	0.086	0.000	-0.183	-0.124	0.110	0.140	0.216	0.000
student task talk with teacher	302	**0.349**	0.239	**0.881**	0.109	-0.216	**0.395**	0.194	**0.436**	0.240	**0.367**
student on task behaviour	301/302/320	**0.384**	-0.076	**-0.373**	-0.097	0.052	0.143	0.245	0.063	**-0.294**	0.163
student unwanted or competing behaviour	330/305/6/7/8/340/350/360	**-0.307**	-0.009	0.174	-0.035	-0.080	-0.140	-0.128	-0.092	**0.256**	**-0.253**

No further significant correlations were found between teacher verbal behaviour to the target student and proximity to them that would indicate characteristic behaviour.

Commentary Teacher proximity to the target student shows a marked decrease (seconds per minute) in year 7 and 8 which continues in

subsequent year levels. Teacher proximity did not relate significantly with either teacher praise, reprimand or behaviour talk in any meaningful manner. Small to moderate relationships were found with respect to teacher task talk to the target student and teacher proximity across 6 year levels. These results indicate proximity is not employed as a classroom management strategy in these classes.

Summary and Discussion

Student on-task behaviour (incidents per minute) was stable across year levels (Figure 5.1.20), student unwanted or competing behaviour increased (trend line Figure 5.1.20) over year levels. The rate (seconds per minute) for student on-task behaviour decreased over year levels (trend line Figure 5.1.21), student unwanted behaviour increased until year 10, when like incidents per minute, it decreased (Figure 5.1.21). Student unwanted or competing behaviour is largely constituted of student social talk to other students (Table 5.1.13). Comparative data is not available for this, as a majority of previous studies have focussed on student behaviour – subsequent event (praise and reprimand) relations.

Incidents per minute is a record (partial interval recording) of whether, or not the behaviour occurred in a 60 second interval. This score was derived from the seconds per minute record, which indicates the time or duration of that behaviour within that 60 second interval. The incident per minute record is subject to the measurement errors reported by Rapp et al, 2001; Meany-Daboul et al, 2007; and Wirth, Slaven and Taylor 2014. In the current study the incident record is only intended to describe whether, or not the defined behaviour occurred in an interval as additional information to the real-time continuous data, represented by the seconds per minute record, and to assess the relationship between the independent and dependent variables on the basis of occurrence per interval alone. The disparities between the two measures are consequently not relevant in the current study in the sense of showing measurement error.

Early research (White, 1975; Thomas et al., 1978) reported the occurrence of reprimands to be greater than that of praise and that teacher approval reduced over year levels. More recent research has indicated a reversal in this (Nafpaktitis

et al., 1985; Merrett and Wheldall, 1989; Winter, 1990; Beaman and Wheldall, 2000). In the current study teacher disapproval (reprimand and behaviour talk) severally and combined was greater than approval (praise) for behaviour directed toward the target student (Table 5.1.19). This finding was replicated when all teacher praise (approval) and reprimand and behaviour talk (disapproval) were combined.

Teacher praise for behaviour overall was minimal, particularly that directed to the target student (Figure 5.1.24), and occurred less often in the junior classes relative to the senior classes. Teacher praise for work to the target student (250) occurred between 0 and 0.823 of recorded intervals, between 0 and 0.143 seconds per minute. Teacher praise for behaviour (260) between 0 and 0.353 of every interval, between 0 and 0.064 seconds per minute. In the junior classes (year 2 to 5 and 6), teacher praise for work to the target student (250) occurred between 0 and 0.148 of recorded intervals, between 0 and 0.143 seconds per minute. Teacher praise for behaviour (260) between 0 and 0.353 of every interval, and between 0 and 0.024 seconds per minute (Table 5.1.6). This result was unexpected (White, 1975; Thomas et al, 1978) as establishing good classroom protocol would presuppose more individually directed teacher praise for work (academic praise) and behaviour (conduct) in the junior classes. For the earlier years there is a greater emphasis on an individual student focus and after this (year 9 and on) the percentage of task talk to the whole class (202) becomes very similar to all teacher task talk (to all targets) combined.

Teacher reprimands (270) occurred between 0 and 0.706 of recorded intervals and behaviour talk (230) occurred between 0 and 0.765 of recorded intervals (Table 5.1.5). Maximum occurrence was consistently for years 7 and 8. This was the same for all teacher verbal behaviour, there is a greater occurrence in years 7 and 8. This reflects teaching this age group as more challenging than other year levels and a corresponding increase in teacher task talk as a consequence of this. As a means of maintaining student on-task behaviour at high levels and student unwanted behaviour at low levels, teacher verbal behaviour, teacher task talk in particular, increases in rate.

Thomas et al. (1978) found rates of disapproval of 0.58/min and rates of approval of 0.20/min. for year level 7 for ten teachers. There was no differentiation between praise for academic behaviour or conduct and recordings were only made given a contingent relationship. In the current study, praise for work or academic behaviour was differentiated from praise for behaviour. Seven of the ten teachers in the Thomas et al. study had disapproval ratings three times that of approval.

In the current study rates of teacher disapproval (230/270) were greater than teacher approval for year level 7 and 8 (incidents per minute and seconds per minute) for behaviour directed to the target student. For all teacher praise, and reprimand and behaviour talk combined (seconds per minute), teacher disapproval was 1.702 times greater than all teacher praise for work and behaviour combined. These results indicate teacher disapproval remains a significant management strategy for these year levels.

Trends Across Year Levels

White (1975), Wheldall et al. (1989) and Beaman and Wheldall (2000) found teacher approval decreased over year levels (as students increase in age).

In the current study teacher praise to the target student for work and behaviour, severally and combined (250, 260, 250/260), increased over year levels (Table 5.1.22), however decreased for all teacher praise combined (to the whole class, to the target student and to other students) for both incidents per minute and seconds per minute.

Numerous studies have reported significant correlations between teacher approval and disapproval and student on-task behaviour (Thomas et al., 1978; Nafpaktitis et al., 1985; Merrett and Wheldall, 1987; Wheldall et al., 1989; Winter, 1990; Beaman et al., 2000; and Swinson and Harrop, 2001.) Wheldall et al, (1989) reported significant positive correlations between student on-task behaviour and both approval to academic behaviour (r=0.44) and approval to social behaviour (r=0.37) and a negative correlation between teacher disapproval to social behaviour and on-task behaviour (r=-0.32).

Winter, (1990) reported a significant positive correlation between total teacher approval and student on-task behaviour (r=0.40) and a significant negative correlation between teacher disapproval and student on-task behaviour (r=-0.40). None of these studies has emphasised the relationship between teacher disapproval and student unwanted or competing behaviour despite the presence of a substantive research base – reprimands were more effective when they were delivered in close proximity than when they were delivered at a greater distance (Pfiffner, O'Leary, Rosen and Sanderson, 1985; Van Houten, Nau, Mackenzie-Keating, Sameoto and Colavecchia, 1982); higher frequencies of reprimand delivery were associated with lower frequencies of disruptive behaviour, and they are most effective when they consistently follow each instance of an unwanted behaviour.

In the present study, no consistent significant relationships were found between teacher behaviour directed to the target student (teacher praise for work, praise for behaviour, reprimand and behaviour talk) severally or combined (230/270 and 250/260) and student on-task behaviour.

Similarly, no consistent significant relationships were found between teacher behaviour directed to the target student and student unwanted or competing behaviour. No significant positive correlations were found across year levels for either teacher praise or teacher reprimands and student on-task behaviour that would indicate a characteristic significant relationship exits.

No relationships were found between teacher praise for work and student on-task behaviour. This result is not as would be expected from the literature. Combining teacher reprimands and teacher behaviour talk to the target student rendered no significant positive correlations (Tables 5.1.8 and 5.1.9).

Correlations of teacher verbal behaviour to the target student with student on-task and unwanted behaviour show a lack of any consistent significant relationships. These results question both the generalisation of findings from individual functional analysis studies to the classroom setting and the utility of individually designed and effected interventions in that setting.

When teacher verbal behaviour combined (to the whole class, to the target student and to other students) was correlated with student on-task and unwanted behaviour (Table 5.1.18) moderate to large positive relationships were found between student on-task behaviour and all teacher task talk (202/220/221) for years 3, 4, 7 and 8, 9, 10, and 13 ($p < 0.05$). Moderate negative relationships were consistently found between all teacher task talk and student unwanted behaviour for year levels 5 and 6, 7 and 8, and 9 ($p<0.05$). For year levels 5 and 6 and 12, teacher behaviour talk and reprimand and behaviour talk related moderately with student unwanted behaviour. Given the variability and small sample size, these trends can be seen as indicative of the relationship between teacher task talk and student on-task and unwanted behaviour.

Teacher task talk combined ranged from a low rate of 23.143 seconds per minute (year 3) to 35.031 seconds per minute (year 9). These figures correspond with 38.57% and 58.385% of available time respectively. Scott et al. (2011) found that in four schools characterised by poverty, teachers were not engaged in teaching students 37.8% of the time. A finding that they interpreted with considerable concern. The rates in the current study are considerably higher although are not directly comparable. Scott et al. defined teaching as any teacher activity that involved interacting with, speaking to, or passively observing students and as such is considerably more inclusive than teacher task talk in the current study.

The correlations below the diagrams (graphs 5.1.5 to 5.1.9 and 5.1.22 to 5.1.26) show large relationships between teacher praise for work and praise for behaviour; teacher reprimand and teacher behaviour talk; and all teacher praise and teacher reprimand and behaviour talk. These results indicate relationships between the behaviours in respect to incidence: that teacher praise for work often occurs in temporal proximity with teacher praise for behaviour; similarly, teacher reprimand is associated with teacher behaviour talk, and teacher praise for work and behaviour combined with teacher reprimand and behaviour talk. The relationships for all targets combined were stronger than those obtained for teacher verbal behaviour directed to the target student alone. The latter relationship, teacher praise for work and behaviour and teacher reprimand and behaviour talk suggest that praise is used to ‘offset’ reprimand and behaviour talk by incidence, not by time.

All correlations are seconds per minute of occurrence and as such are not equivalent measures with those adopted by the research referred to. Similarly, dispersion (incidents per minute) shows the mean occurrence across intervals, which is derived from seconds per minute of that behaviour. Indications are that the greater the sample size the time of the behaviour (seconds per minute) more approximates incidents per minute. Sampling was real time continuous recording, video analysed with averages of seconds of behaviour summed across 60 second intervals. This process should have retained the integrity of the data and minimised sampling error relative to time sampling procedures.

The data indicated a change in focus from the student to whole of class at year 7 and 8. This was apparent in respect to teacher task talk (Figure 5.1.3) and is also reflected in the proportions of reprimand and behaviour talk and increase in teacher reprimand and behaviour talk (Figure 5.1.8), teacher praise (Figures 5.1.25 and 5.1.26) and teacher proximity (Figure 5.1.29). This 'change over' is a significant characteristic in all graphically presented data (line graphs) throughout the study and indicates student on-task and unwanted behaviour in Primary School to be under different contingencies than Intermediate and Secondary Schools.

The greater percentage of student unwanted behaviour across year levels is student social talk (range 36-100%) to other students rather than more extreme disruptive behaviour (Table 5.1.13). Teacher social talk to the class, target student and other students combined constitutes the fourth highest teacher behaviour (seconds per minute). The rate of teacher social talk to the target student and whole class is surprising as this indicates the teachers to be proactively introducing distraction from task in a characteristic manner. This indicates that it is not entirely an unwanted behaviour (mean 0.832 seconds per minute, Table 5.1.12) and is perhaps seen as 'fostering good teacher-student relationships'.

Teacher proximity to the target student was marked in year levels 2 to 5 and 6, ranging from 9.286 seconds per minute to 20.321 seconds per minute. There was a marked decrease (seconds per minute) in year 7 and 8 which continued in subsequent year levels. Significant moderate relationships were found with respect to teacher task talk to the target student and teacher proximity across 6 year levels. Teacher proximity did not relate significantly with either teacher praise or

reprimand, nor with student on-task or unwanted behaviour in any meaningful manner. This lack of relationship between teacher proximity and praise and reprimand is surprising as teacher proximity is a simple strategy for increasing the effectiveness of teacher's interactions with students' (Gunter, Shores, Jack, Rasmussen and Flowers, 1995). Both praise (Burnett, 2001; Feldman, 2003; Lampi et al., 2005) and reprimand (Van Houten et al.,1982; Pfiffner, et al. 1985) have been shown to be more effective when delivered in close physical proximity. The high rate of occurrence, particularly for the lower year levels, indicates the non-contingent maintenance of the teacher as focal.

These trends, teacher verbal behaviour to all targets combined relating strongly with student on-task and unwanted behaviour are in strong contrast to the lack of significant relationships between teacher behaviour directed to the target student and student on-task and unwanted behaviour. This is unsurprising as overall teacher interaction with a particular (the target) student is minimal.

The mean of teacher praise for work to the target student (250) is 0.041 seconds per minute, combined with a dispersion over 0.158 intervals (Figure 5.1.3) and mean student on-task behaviour is 47.07 seconds per minute. The ratio of teacher praise to student on-task behaviour for teacher praise for work (seconds per minute) is 0.087%. If all recorded occurrences of teacher praise for work were contingent on student on-task behaviour, the minimal occurrence of praise does not seem sufficient to define on-task behaviour. Teacher praise for behaviour (260) to the target student, mean 0.022 seconds per minute, dispersion 0.074 intervals occurs less often (ratio of 0.047%). Hester et al. (2009) outlined what they saw as critical factors for the effective use of praise. These included: contingency, immediacy, consistency, effect on the behaviour, proximity and specificity. Increasing the occurrence of praise or task specific praise to an individual student, such that it approximates those parameters cannot be seen as a practicable or effective strategy on the basis of the current results.

Similarly, the mean of teacher reprimands to the target student (270) of 0.066 seconds per minute combined with a dispersion over 0.224 intervals (the independent variable), when mean student unwanted or competing behaviour (Figure 5.1.4.) is 2.196 seconds per minute dispersed over 0.628 intervals (the

dependent variable), does not seem sufficient by itself to contain or limit that behaviour. The ratio of teacher reprimands to student unwanted behaviour is 3%. Research findings have established punishment to result in a greater reduction in the response rate of unwanted behaviour if it is delivered on a continuous schedule, is contiguous with, contingent and immediate upon the unwanted behaviour (Spradlin, 2002; Lerman and Vorndran, 2002). The above results do not approximate these research-based parameters either for praise or reprimand even if all teacher praise and reprimand were contingent upon the respective behaviour.

These results question the utility of an individual behaviour-subsequent event focus within the classroom. In contrast, over most year levels positive significant relationships were found between teacher task talk combined (to the whole class, to the target student and to other students) and student on-task behaviour and negative relationships with student unwanted behaviour. Results indicate the principal defining parameters of student on-task and student unwanted or competing behaviour are teacher task talk to the whole class alone (202) and combined (202/220/221), that is, to the whole class, to the target student and to other students summed. That is, and understandably, teacher task talk that is public in nature. The lesser relationships found with teacher task talk combined indicates the importance of the public nature of teacher task talk in these relationships. This is in keeping with the views expressed by Kazdin (1973) in regard to vicarious reinforcement) and also by Galizio (1979), Hayes, Brownstein and Kern (1986), Martens (1990), Hackenberg and Joher (1994) and Schmitt (1998), who stated that instructional control or compliance with instruction is more than a function of the relationship between the instruction and the contingencies. This supports the tenet in the current study i.e. that with a greater rate of teacher task talk, greater levels of student on-task behaviour and lesser levels of competing behaviour will be realised (Hypothesis $H_{overarching}$).

5.2 Teacher – Student Behaviour across Primary, Intermediate and Secondary Schools

Introduction

The data relating to teacher praise, reprimands, behaviour talk, task talk, social talk, teacher proximity and student on-task behaviour and unwanted behaviour were grouped according to Primary (years 2 to 6 inclusive), Intermediate (years 7 and 8) and Secondary Schools (years 9 to 13 inclusive). All Primary classes involved considerable group based instruction, Intermediate involved some group instruction and Secondary involved none.

It was expected that teacher praise and task talk, reprimands and behaviour talk would be higher in the earlier year levels (Primary School) because of the need to establish classroom protocol or expected behaviour, and that the need for instructions would reduce over the years. This expectation is consistent with the practice of group based instruction common in Primary School classes which implicitly provides greater opportunity for such behavioural consequences. Teacher social talk was expected to be minimal in Primary levels and variable across Intermediate and Secondary Schools, this should reflect greater student social or conversational capability and endeavours to establish teacher–student 'friendly' relationships.

The principal relationships expected were between teacher task talk to the whole class and all teacher task talk combined and student on-task behaviour – the other variables being secondary to these relationships. Thus, the greater the rate of teacher task talk, the greater rates of student on-task behaviour and lesser rates of competing or unwanted behaviour would be realised. If teacher talk is task or activity specific and this focus is frequent and ongoing or situationally pervasive, rather than personally targeted, this defines the situation, behavioural expectation and performance (Introduction and Section 5.1).

Reprimands mainly result in the immediate suppression of unwanted behaviour, albeit temporarily. To be effective, punishment should stop when the

behaviour stops **(**Lerman and Vorndran,2002). Any ongoing positive effect from such intervention is dependent on the immediacy of redirection to work, directing task related attention to the on-task behaviour of others (reducing the public nature of the intervention), and all within the period in which the unwanted behaviour is attenuated, i.e., the teacher continuing to proactively define the situation as task related ensures an unpunished task related response is available (Fisher et al., 1994; Spradlin, 2002). These parameters are implicitly met by ongoing and pervasive teacher task talk.

Research has not evaluated 'task talk' in any but a cursory descriptive manner (most teacher talk was 'neutral' (Shores, 1993), or was 'feedback on performance,' (Galton, Simon & Croll, 1980); or 'were instructional sequences,' (Gunter, Shores, Rasmussen & Flowers, 1993; Shores, Gunter & Jack, 1993), 'academic or social requests' (Wehby, Symons & Shores, 1995), not in respect to function.

Descriptive analyses of classroom behaviour have shown that most teacher child interactions are, "neutral … not intended to directly control or manage behavior" (O'Leary & Sanderson, 1990, p. 257), are instructional sequences or academic talk (Galton, Simon, & Croll, 1980; Shores, 1993; Shores, Jack et al., 1993; Wehby, Symons & Shores, 1995; Wehby and Yoder, 2002). Within the class setting:

> Teacher talk is not only dominant, but also regulatory … Teachers in the classrooms we studied do most of the talking. Their talk is most often directed at the entire class and less frequently at individual members of the class. … Students' verbal behaviour is much more limited than that of teachers. They are basically responders rather than initiators. (Collins & Seidman (1972) p. 2).

It was expected that: a high rate of teacher task talk would be associated with a high rate of student on-task behaviour. High rates of teacher task talk are both discriminative stimuli for gaining and maintaining task orientation, are prescriptive or defining of the contingency operating for student attention and

behaviour. This would be evident in a significant positive correlation between the rate of teacher task talk to the whole class (202) and combined (202/220/221) and student on-task behaviour (301 and 301/302/320), Hypothesis H_1. Further, that this relationship would be considerably stronger than an individual focus as this defines the learning environment.

In the previous Section 5.1, no consistent significant relationships were found between teacher behaviour directed to the target student (teacher praise for work, praise for behaviour, reprimand and behaviour talk) severally or combined (230/270 and 250/260) and student on-task behaviour, nor between teacher behaviour directed to the target student and student unwanted or competing behaviour. The data indicated a change in focus in teacher verbal behaviour from the student to whole of class at year 7 and 8. This was apparent in respect to teacher task talk (Figure 5.1.3) and is also reflected in the proportions of reprimand and behaviour talk and increase in teacher reprimand and behaviour talk (Figure 5.1.8), teacher praise (Figures 5.1.27 and 5.1.28) and teacher proximity (Figure 5.1.29), all values being greater for Primary School data. This 'change over' is notable in all graphically presented data (line graphs) throughout the Section.

Results (Section 5.1) indicated the principal defining parameters of student on-task and student unwanted or competing behaviour are teacher task talk combined, that is, to the whole class, to the target student and to other students summed. Individually targeted behaviour -subsequent event relations were not sufficient to describe student on-task or unwanted behaviour.

Method

Subjects Participants were teachers and students within 'mainstream' schools across different year levels (years 2–13).

Classes recorded in Primary and Intermediate Schools were mainly general in nature (reading writing arithmetic and or topic based (one art class). Subjects recorded in the Secondary School included mathematics, English and religious studies.

Twenty-six teachers participated in the study. Years teaching experience ranged from 4 to 43 years, the mean was 16.9 years, median 15 years. 62 students participated, six were Primary School students, 32 were Intermediate School and 24 Secondary School.

The research was focused on observing and describing teacher practice during normal classroom interactions and tasks and student responses to these.

There was no necessity to personally identify either teachers, students or classes. School identities were retained simply for ease of recognition.

Participation was voluntary.

Setting The settings were general education classrooms in Primary and Intermediate Schools in the Hastings and Napier areas in State Schools and in a State Integrated Secondary School.

Three Primary Schools participated (deciles 2, 3 and 1) year levels 1 to 6; ages 5 years to 11 years two of which included year levels 7 and 8; two Intermediate Schools (decile 2 and 8; year levels 7 and 8; ages 11 years to 12 years) and one Secondary School (decile 4; levels 9 to 13; ages 13 to 18). The schools selected include a range of students from varying socio-economic backgrounds.

The Secondary School was a State Integrated (i.e. state funded) religion-based single sex (male) school.

Procedure The procedure followed involved videoing classrooms during normal teacher instruction (Section 2.3).

Data Collection The data relating to teacher praise, reprimands, behaviour talk, task talk, social talk, teacher proximity and student on-task behaviour and unwanted behaviour were grouped according to Primary (years 2 to 6 inclusive), Intermediate (years 7 and 8) and Secondary Schools (years 9 to 13 inclusive). All Primary classes involved considerable group based instruction, Intermediate involved some group instruction and Secondary involved none.

Behaviour observation codes are described in Section 2.7, inter-observer agreement in Section 2.9 and Section 4.1 of the Results Section.

Agreement was calculated by dividing the number of agreements by the number of agreements and disagreements and multiplying by 100%. Mean occurrence agreement 97.65%, and median 98.99% were calculated by behaviour across sessions.

Data Analysis Rates (incidents per minute) and duration (seconds per minute) of praise and reprimand were calculated across year levels as a means of deducing differences, if any, between them, and for comparison with previous studies. All Figures and Tables represent the mean values for those particular analyses (Primary, Intermediate and Secondary Schools).

Teacher task talk was assessed as an overriding functional variable (independent variable) relative to other teacher behaviour (Hypothesis H_1).

Teacher verbal behaviour was correlated with on-task behaviour and unwanted or competing behaviour (all correlations are two-tailed tests). Graphical representation was undertaken to elaborate on findings where necessary.

The on-task and unwanted behaviour of the target child is taken as a proxy measure of class performance (the dependent variable). The direction of teacher and student behaviour are measured, for example, teacher task talk to the target student, to other students and to the whole class. The direction of student behaviour is toward the teacher or other students.

Student off task behaviour was not measured as it is the reciprocal of on-task behaviour. Student unwanted behaviour includes social talk to other students, disruptive behaviour, aggression, abuse etc., as outlined in the Section relating to behaviour definitions (Section 2.7). The direction or target of teacher and student behaviour are measured, for example, teacher task talk to the target student, to other students and to the whole class, the direction or target of student behaviour is toward the teacher or other students. The combined data was truncated (made of equal interval length) to enable correlation tables to be completed and independent variables correlated with dependent variables. Primary correlation tables were

constructed using seconds per minute data alone which was summed within 60 second intervals and averaged across samples (Primary, Intermediate and Secondary Schools). This measure included all data from within-session real-time recordings and represents all data recorded on a continuous basis. This enables a more accurate analysis of the temporal relationships between the independent and dependent variables (Rapp et al., 2001), than would be found in temporally discontinuous or interval recording ('incidence per minute' in this study). Teacher behaviour was correlated with on-task behaviour and unwanted or competing behaviour (all correlations are two-tailed tests). Cross correlations were calculated in order to assess the behaviour- subsequent event nature of the respective independent and dependent variables. Contiguous correlations do not show the temporal relations e.g. teacher praise succeeding student on-task behaviour and reprimand succeeding student unwanted behaviour. The optimal correlation between these variables indicates the time taken for the effect to impact on the value of the other or the protracted nature or otherwise of the independent and dependent variables. Percentages of teacher praise and reprimand were calculated relative to student on-task and unwanted behaviour respectively to deduce the occurrence of these compared with the referent or background occurrence.

All Figures and Tables represent the mean values for those particular analyses (Primary, Intermediate and Secondary Schools). Correlation matrices were constructed from this data.

The results were used to inform further analysis.

Results

Data Pertaining to the Target Student

Table 5.2.1 Mean Occurrence of Primary, Intermediate and Secondary School Data Showing Teacher Verbal Behaviour Directed (Incidence and Seconds per Minute) to the Target Student, Correlations of Teacher Verbal Behaviour with Student On-Task Behaviour, and Correlations of Teacher Reprimands and Behaviour Talk with Student Unwanted Behaviour, with no Lag, One and

Teacher Behaviour Directed to the target student:			**Primary**			**Intermediate**			**Secondary**	
			N=6	**Correlation:**		**N=32**	**Correlation:**		**N=29**	**Correlation:**
		Seconds/minute	Incidents/minute	301/302/320	Seconds/minute	Incidents/minute	301/302/320	Seconds/minute	Incidents/min	301/302/320
student on task	301/302/320	51.728	1	1	47.284	1	1	46.662	1	
teacher praise target student for work	250	0.026	0.105	-0.439	0.063	0.824	-0.251	0.045	0.545	-0.342
teacher praises student for behaviour	260	0.009	0.053	0.176	0.014	0.353	-0.022	0.017	0.273	0.124
teacher reprimands target student	270	0.044	0.132	-0.005	0.073	0.706	-0.110	0.063	0.606	-0.140
teacher task talk to target student	220	0.750	0.474	0.055	1.064	1	-0.036	1.214	0.970	-0.242
teacher behaviour talk to target student	230	0.013	0.053	0.165	0.116	0.765	-0.227	0.050	0.455	-0.115
teacher social talk to target student	240	0.013	0.053	0.081	0.030	0.324	-0.243	0.697	0.091	-0.189
teacher reprimand and behaviour talk to target student	270/230	0.680	0.895	0.016	0.188	0.912	-0.231	0.113	0.727	-0.169
unwanted or competing behaviour	330/304/5/6/7/8/340/350/360	1.539	1.026	-0.167	3.309	1	-0.596	4.300	1	-0.523
range of teacher behaviour directed to target student	Range (Seconds)	0.008-0.75			0.01-1.06			0.02-1.21		
Correlation Between Teacher Reprimand And Behaviour	270/230 with									
Talk And Unwanted or Competing Behaviour	330/304/5/6/7/8/340/350/360									
no lag				0.055			0.145			-0.047
one interval lag on reprimands and behaviour (270/230)				-0.047			0.162			0.150
two interval lag on reprimands and behaviour (270/230)				-0.288			0.009			0.103

Student on-task behaviour decreased over year levels (51.728 seconds per minute to 46.662 seconds), student unwanted or competing behaviour increased (1.539 seconds per minute to 4.299 seconds).

No significant correlations were found between any of the above behaviour (teacher praise for work, praise for behaviour, reprimands, behaviour talk, social talk addressed to the target child and student on-task behaviour, nor for teacher reprimand and behaviour talk, severally and combined and target student unwanted behaviour. Teacher interactions with the target student are minimal, the range for teacher behaviour toward the target student (250/260/270/220/230) being 0.008 to 0.75 seconds per minute for Primary School Data, 0.01 to 1.06 seconds per minute for Intermediate data, and 0.02 to 1.21 per minute for Secondary School data. Teacher task talk to the target student increased over the three school environments.

Student unwanted or competing behaviour (Codes: 330/304/305/306/307/308/340/350/360) was 1.44, 3.31 and 4.30 seconds per minute respectively. This was 1.9, 3.1 and 3.5 times greater than teacher task talk to the target student for the respective school groupings.

This differential, plus the insignificance of relationship between teacher task talk to the target child and student on-task behaviour is not consistent with the notion of an individual focus defining student behaviour.

Introducing a one or two interval lag on unwanted or competing behaviour and teacher reprimand and behaviour talk resulted in no substantive changes to the respective correlations. Given that reprimands can be more properly seen as subsequent rather than contiguous events, differences would be more likely to be expected.

Teacher task talk to students (220/221 combined) constituted 61.408 per cent of all teacher task talk for Primary School data, 53.404 percent for Intermediate and 32.598 percent for Secondary School data (Table 5.2.2). The complement, teacher task talk to the whole class (202) increases over Primary, Intermediate and Secondary School, indicating a considerable and relatively greater emphasis on student directed instruction in the earlier years and toward whole class instruction for the older. No significant relationships were found between these measures and student on-task behaviour or student unwanted behaviour.

Table 5.2.2 Mean Occurrence (Incidents and Seconds per Minute) of Teacher Task Talk Severally and Combined Directed toward The Target Student, Across Primary, Intermediate and Secondary Schools

Teacher Task Talk:	Behaviour Code:	Primary:		Intermediate:		Secondary:	
		Seconds/minute	Incidents/minute	Seconds/minute	Incidents/minute	Seconds/minute	Incidents/minute
teacher task talk to whole class	202	9.614	1	12.801	1	20.571	1
teacher task talk to target student	220	0.750	0.474	1.064	1	1.214	0.970
teacher task talk to other students	221	14.548	1	13.607	1	8.735	1
all teacher task talk	202/220/221	24.912	1	27.472	1	30.519	1
all teacher task talk to students	220/221	15.298	1	14.671	1	9.949	1
correlation of teacher task talk to students with on task behaviour	220/221 correl. with on task	-0.229		-0.196		-0.064	
correlation of teacher task talk to students unwanted behaviour	220/221 correl. with off task	0.322		0.297		0.033	
teacher task talk to class as percentage of all teacher task talk	202 as % of 202/220/221	38.592		46.596		67.402	
teacher task talk to students as percentage of all teacher task talk	220/221 as % of 202/220/221	61.408		53.404		32.598	

Commentary The lack of significant correlations between teacher verbal behaviour directed toward the target student and student on-task or unwanted behaviour may be attributable to the minimal teacher interaction with the target student (Table 5.2.1).

It was expected that teacher praise, reprimand, behaviour talk and task talk would have been more manifest within the Primary School setting as a means of shaping classroom protocol and establishing behavioural expectation in this setting.

That this is not the case is surprising. Teacher task talk was directed toward students (220/221) more than the whole class for Primary School classes.

Possible reasons for this are that it could be an artefact of sample size and teacher idiosyncrasy or a greater use of group teaching practice (which leaves most of the class without or with remote oversight for the duration of the group) although group teaching practice was characteristic of some of the Intermediate classes. The lack of any significant relationships between the respective teacher verbal behaviour and student on-task or unwanted behaviour for Intermediate and Secondary students questions the presumed advantages of an individual focus, such as group teaching providing greater teacher attention for task.

Moving the data one or two intervals (reprimand and behaviour talk relative to student unwanted behaviour) such that it better reflected the behaviour-subsequent event relation did not substantively alter correlations, none was significant (Table 5.2.1).

Teacher task talk to the whole class was of a lesser rate (seconds per minute), to the target student was less, praise for both work and behaviour was less, reprimand and behaviour talk severally and combined was of greater rate and student on-task behaviour higher and unwanted behaviour less for Primary School relative to both Intermediate and Secondary Schools (Table 5.2.1).

Teacher Verbal Behaviour Combined

Table 5.2.3 shows teacher verbal behaviour combined such that it reflects the sum of teacher verbal behaviour for that category to the different targets (to the whole class, to the target student, to other students and combined).

Table 5.2.3 Mean rates (Incidents and Seconds per Minute) of Teacher Praise, Reprimands, Behaviour Talk, Social Talk, Task Talk and Student On-Task Behaviour across Primary, Intermediate and Secondary Schools (Combined Data), and Correlations with Mean Rates of Student On-Task Behaviour

Behaviour:	**Behaviour code:**		**primary data:**	**intermediate data:**	**secondary data:**
			N=6	**N=32**	**N=29**
all teacher praise for work	205/250/251	seconds/minute	0.820	1.025	0.652
	correlation with student on task behaviour	correlation	-0.275	-0.164	-0.110
all teacher praise for behaviour	206/260/261	seconds/minute	0.513	0.343	0.271
	correlation with student on task behaviour	correlation	0.007	0.219	0.150
all teacher reprimands	207/270/271	seconds/minute	0.711	0.871	1.441
	correlation with student on task behaviour	correlation	-0.165	-0.073	-0.179
all teacher behaviour talk	203/230/231	seconds/minute	1.320	1.607	1.361
	correlation with student on task behaviour	correlation	-0.104	0.114	-0.077
all teacher social talk	204/240/241	seconds/minute	0.640	1.422	1.441
	correlation with student on task behaviour	correlation	-0.059	-0.351	-0.215
	correlation with student unwanted behaviour	seconds/minute	-0.173	-0.316	0.197
all teacher task talk	202/220/221	incidents/minute	24.912	27.472	30.519
		seconds/minute	1	1	1
	correlation with student on task behaviour	correlation	0.248	**0.384**	**0.452**
student on task behaviour	301/302/320	seconds/minute	51.728	55.137	46.662
		incidents/minute	1	1	1
	correlation with student on task behaviour	correlation	1	1	1

teacher social talk	204/240/241	seconds/minute	0.640	1.422	1.441
		incidents/minute	0.789	1.000	0.970
	correlation with student on task	correlation	-0.077	-0.015	-0.215

Teacher praise for behaviour decreased over year levels, teacher reprimand increased over year levels.

As with teacher verbal behaviour directed to a target student, no significant relationships were found between teacher praise for work, teacher reprimands, and teacher social talk across year levels and student on-task behaviour when teacher behaviour was summed for each category (teacher behaviour to the whole class, to the target student and to other students was combined, Table 5.2.3).

Teacher Task Talk

Teacher task talk (202/220/221) was moderately related ($r=0.452$, $p<0.01$) with student on-task behaviour (301/302/320) for the Secondary School data and for Intermediate School data ($r=0.384$, $p<0.05$). This relationship was not repeated for the Primary School data (Table 5.2.4).

Correlations for the other groups do not approximate significant relationships.

Table 5.2.4 The Mean of Teacher Task Talk Differentiated (Seconds per Minute) by Target and Combined and Correlations with Mean Rates of Student On-Task Behaviour, across Primary, Intermediate and Secondary Schools

					Correlation With On Task Behaviour:		
Teacher Task Talk (seconds/minute)	**Behaviour Code:**	**Primary:**	**Intermediate:**	**Secondary:**	**N=6**	**N=32**	**N=29**
teacher task talk to whole class	202	9.614	12.801	20.571	0.249	**0.484**	**0.585**
teacher task talk to target student	220	0.750	1.064	1.214	0.055	-0.036	-0.242
teacher task talk to other student	221	14.548	13.607	8.735	-0.040	-0.196	0.030
sum of teacher task talk	202/220/221	24.912	27.472	30.519	0.248	**0.384**	**0.452**

Moderate to large relationships were found (Table 5.2.4) with Intermediate and Secondary School data between all teacher task talk (202/220/221) and particularly with teacher task talk to the whole class (202) and student on-task behaviour ($r=0.484$, $p<0.01$, and $r=0.585$, $p<0.001$ respectively). The relationship between all teacher task talk and student on-task behaviour for Primary School data was not significant.

Table 5.2.5 The Sum of the Mean Rates (Seconds per Minute)of Teacher Task Talk to all Targets Correlated with Means of Student On-Task Behaviour Combined and Student Unwanted Behaviour Across Primary Intermediate and Secondary Schools

Behaviour:	**Behaviour code:**		**primary data:**	**intermediate data:**	**secondary data:**
			N=6	**N=32**	**N=29**
all teacher task talk	202/220/221	seconds/minute	24.912	27.472	30.519
		incidents/minute	1	1	1
correlation with student on task	301/302/320	correlation	0.248	**0.384**	**0.452**
correlation with student unwanted behaviour	330/305/6/7/8/340/350/360	correlation	-0.168	**-0.358**	**-0.556**

Teacher task talk related moderately to student on-task behaviour for both Intermediate ($r=0.384$, $p<0.05$) and Secondary ($r=0.452$, p0.02) school students. Moderate to large negative relationships were found between teacher task talk and student unwanted or competing behaviour, $r=-0.358$, $p< 0.05$ and r -0.556, $p< 0.01$ respectively. Figures for Primary School were both elevated, of consistent valence but not significant (Table 5.2.5).

Teacher task talk to the whole class (202) was correlated with student 'working, attending' (301) differentiated from student on-task behaviour combined (301/302/320. The relationships found are shown in the following table (Table 5.2.6)

Table 5.2.6 Correlations between the Mean Occurrence (Seconds per Minute) of Teacher Task talk to the Whole Class (202) and Student On-task Behaviour Differentiated (301) and Student Unwanted Behaviour

Teacher task talk to whole class (202)		Primary	Intermediate	Secondary	
student on-task behaviour (301)	202 with on-task (301)	0.251	**0.534**	**0.515**	P<0.01
student unwanted behaviour	202 with unwanted behaviour	0.003	**-0.548**	**-0.674**	)P<0.001
			P<0.01		

Relationships for Primary School data are insignificant. Relationships found for both Intermediate and Secondary Schools were large and positive for 'on-task' behaviour (301), and large and negative for the relationship with student unwanted behaviour.

Commentary The moderate to large relationships found between all teacher task talk and student on-task behaviour (Table 5.2.4) for Intermediate and Secondary School data support the hypothesis that, a high rate of teacher task talk would be associated with a high rate of student on-task behaviour (Hypothesis H_1)**.**

The significant negative correlations obtained between all teacher task talk and student unwanted behaviour for Intermediate and Secondary School data are consistent with the hypothesis (Hypothesis H_2) that the greater the rate of task talk, the greater rates of on-task behaviour and lesser rates of unwanted behaviour will be realised. The data for Primary Schools although elevated and of similar valence, does not do so. These findings are further emphasised (large relationships and effect sizes) when the data is differentiated and relationships ascertained between teacher task talk to the whole class and student on-task behaviour (301, Table 5.2.6).

The relationship between all teacher task talk to the whole class and combined and student on-task behaviour for Primary School data is elevated but not significantly so (Table 5.2.4). This may reflect the relative lower rate (seconds per minute) of teacher task talk to the whole class and teacher task talk combined for that group (9.61 seconds per minute compared with 12.80 and 20.57 seconds for Intermediate and Secondary Schools and 24.91 seconds per minute compared to 27.47 and 30.52 respectively for teacher task talk combined). That is, at a certain rate (seconds per minute) teacher task talk loses the relationship with student on-task behaviour and other factors become prescriptive or defining.

This may also partly reflect the lesser sample size for the Primary School group and hence be more reflective of individual teacher differences.

These relationships are further explored from the data presented in Tables 5.2.7 and 5.2.8.

Teacher Reprimand and Behaviour Talk

Table 5.2.7 The Sum of Mean Rates of Teacher Reprimands and Behaviour Talk (Seconds per Minute) Differentiated and Combined, Correlated with Mean Rates of Student On-Task Behaviour and Unwanted Behaviour), Across Primary, Intermediate and Secondary Schools

Behaviour:	Behaviour code:		Primary data:	Intermediate data:	Secondary data:
			N=6	N=32	N=29
all teacher praise for work	205/250/251	seconds/minute	0.820	1.025	0.652
	correlation with student on task behaviour	correlation	-0.165	-0.073	-0.179
all teacher behaviour talk	203/230/231	seconds/minute	1.320	1.607	1.361
	correlation with student on task behaviour	correlation	-0.104	0.114	-0.077
sum of reprimand and behaviour talk	203/230/231/207/270/271	time/min	2.031	2.478	2.801
		incidents/min	0.974	1	1.030
	correlation with student on task behaviour	correl.	-0.154	0.080	-0.142
	correlation with unwanted behaviour	correl.	0.124	0.151	**0.258**
student unwanted behaviour	330/305/306/307/308/340/350/360	time/min	1.443	3.309	4.300
		incidents/min	0.816	1	1.030
	correlation with student on task behaviour	correl.	-0.417	**-0.414**	**-0.523**

Student on-task behaviour for Primary School data is 51.728 seconds per minute, for Intermediate 47.284, and Secondary 46.662, all teacher task talk is 24.912 seconds per minute, 27.471 and 30.519 respectively (Table 5.2.3). Teacher reprimands are of considerably higher rate (seconds per minute) for Primary School than are evident in both Intermediate and Secondary School data (70.96% of reprimand and behaviour talk compared to 28.67% and 31.10% respectively, Table 5.2.5). The larger amount of the sum of teacher reprimand plus behaviour talk for both Intermediate and Secondary groupings is teacher behaviour talk. The larger amount of student unwanted or competing behaviour is social talk to other students for Primary, Intermediate and Secondary School data (93.31%, 83.37% and 90.72% respectively, Table 5.2.3). The sum of (all) teacher reprimands (207/70/71) correlated significantly ($r=-0.674$, $p<0.001$) with student unwanted behaviour for Secondary School data.

No further significant relationships were found between teacher reprimands and behaviour talk and student on-task behaviour or unwanted or competing behaviour.

Introducing one and two interval lags, to better reflect the behaviour-subsequent event nature of reprimand and behaviour talk resulted in no substantive relationships being found (Table 5.2.8).

Table 5.2.8 Correlations Between Mean Rates (Seconds per Minute) of Teacher Reprimand and Behaviour Talk Combined to all Targets Combined Across Primary, Intermediate and Secondary Schools

Correlations Between All Teacher			**Schools:**	
Reprimands And Behaviour Talk		**Primary**	**Intermediate**	**Secondary**
And Student Unwanted Behaviour			**Correlations**	
	real time recording	0.124	0.151	0.258
	1 interval lag	0.040	0.273	0.213
	2 interval lag	-0.172	-0.163	0.065

The principal differences between the Primary School data and the Intermediate and Secondary School data are found in regard to lower rates (seconds per minute) of teacher task talk, higher rate of teacher reprimands, a higher rate of teacher proximity and a higher rate of student on-task behaviour.

This is consistent with the hypothesis that a relationship exists between low rates of teacher task talk, greater reprimand and less student on-task behaviour, that these weaken or make non-existent the relationship between student on-task behaviour and teacher task talk. When reprimands and behaviour talk are combined, the results indicate the opposite trend, that teacher behaviour talk is greater for Intermediate and Secondary Schools studied and can perhaps be seen as behaviour talk supplanting reprimands. Student unwanted or competing behaviour which is mainly constituted of student social talk to other students (330) increases over school type or age of student (Table 5.2.9).

Table 5.2.9 The Mean Rates Across Primary, Intermediate and Secondary Schools (Seconds per Minute) of the Total of Teacher Task Talk, Reprimands, Reprimands and Behaviour Talk Student Social Talk and On-task and Unwanted Behaviour

Behaviour:	**Behaviour Code:**		**Primary:**	**Intermediate:**	**Secondary:**
student on task	301/302/320	seconds/minute	51.728	47.284	46.662
sum of teacher task talk	202/220/221	seconds/minute	24.912	27.472	30.519
sum of teacher reprimand	207/270/271	seconds/minute	1.441	0.711	0.871
sum of teacher reprimand and behaviour talk	207/203/270/230/271/231	seconds/minute	2.031	2.478	2.801
student unwanted or competing behaviour	330/304/05/06/07/07/340/50/60	seconds/minute	1.443	3.309	4.300
student social talk to other students	330	seconds/minute	1.346	2.758	3.901
% of social talk in unwanted behaviour			93.313	83.368	90.717
% of reprimand in reprimand and behaviour talk			70.959	28.674	31.102

The Ratio of Teacher Praise to Student On-Task Behaviour and Teacher Reprimand and Behaviour Talk to Student Unwanted Behaviour

The ratio of teacher praise for work relative to student on-task behaviour and teacher reprimand and behaviour talk relative to student unwanted behaviour were calculated as percentages. This was undertaken to look at the occurrence of praise and reprimand against the referents or associated background behaviour, for praise for work (250), and reprimand and behaviour talk (230/270) to the target student and to all subjects combined. For Primary, Intermediate and Secondary Schools this is depicted in Tables 5.2.10, 5.2.11 and 5.2.12. A score of 100% indicates a 1:1 relationship in occurrence between the stated variables, teacher praise for work and student on-task behaviour, and teacher reprimand and behaviour talk and student unwanted behaviour. Student on-task and unwanted behaviour is the same for both analyses. Teacher verbal behaviour is as directed to the target student alone or to the whole class, the target student and other students combined.

In Table 5.2.10 (Primary School), 5.2.11 (Intermediate School) and 5.2.12 (Secondary School) the ratios for teacher praise for work across all school types are near zero (0.051% for Primary School, 0.134% for Intermediate and 0.096% for Secondary School). The ratio of teacher reprimand and behaviour talk for Intermediate and Secondary School are 5.694% and 2.623% respectively. For Primary School the ratio is considerably higher at 44.160% which indicates an almost 1:0.5 ratio between teacher reprimand and behaviour talk to the target student and student unwanted behaviour and this on a minimal ratio of student directed praise for work and a lower rate of teacher task talk than for Intermediate or Secondary School data.

Table 5.2.10 The Ratio of Mean Rates (Seconds per Minute) of Teacher Praise for Work to Student On-Task Behaviour, Teacher Reprimand and Behaviour Talk to Student Unwanted Behaviour (means) as Percentages for Teacher Verbal Behaviours Directed to the Target Student and all Subjects Combined for Primary Schools

	Behaviour Code.	Ratio (%).
teacher praise for work to target student	250	0.051
all teacher praise for work	205/250/251	1.586
teacher reprimand and behaviour talk to target student	230/270	44.160
all teacher reprimand and behaviour talk	203/230/231/207/270/271	219.670

Table 5.2.11 The Ratio of Mean Rates (Seconds per Minute) of Teacher Praise for Work to Student On-Task Behaviour, Teacher Reprimand and Behaviour Talk to Student Unwanted Behaviour (means) as Percentages of the Means of Teacher Verbal Behaviours Directed to The Target Student and all Subjects Combined for Intermediate Schools

	Behaviour Code.	Ratio (%).
teacher praise for work to target student	250	0.134
all teacher praise for work	205/250/251	2.167
teacher reprimand and behaviour talk to target student	230/270	5.694
all teacher reprimand and behaviour talk	203/230/231/207/270/27	74.895

Table 5.2.12 The Ratio of Mean Rates(Seconds per Minute) of Teacher Praise for Work to Student On-Task Behaviour, Teacher Reprimand and Behaviour Talk to Student Unwanted Behaviour (means) as Percentages of Means for Teacher Verbal Behaviours Directed to the Target Student and All Subjects Combined for Secondary Schools

	Behaviour Code.	Ratio (%).
teacher praise for work to target student	250	0.096
all teacher praise for work	205/250/251	1.397
teacher reprimand and behaviour talk to target student	230/270	2.623
all teacher reprimand and behaviour talk	203/230/231/207/270/271	65.153

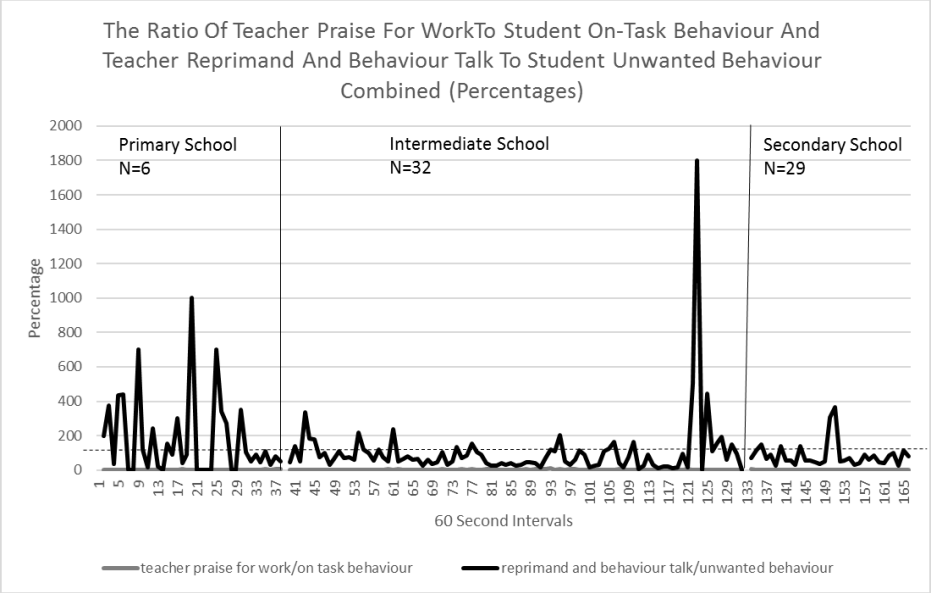


Figure 5.2.1 The Ratio of Mean Rates (Seconds per Minute) of Teacher Praise for Work To Student On-Task Behaviour And Teacher Reprimand And Behaviour Talk to the Mean Rates of Student Unwanted Behaviour Across School levels

When the ratio of teacher reprimand and behaviour talk combined (to the whole class, to the target student and to other students summed (Tables 5.2.10, 5.2.11, 5.2.12)) to student unwanted behaviour is considered, ratios of teacher reprimand and behaviour talk to student unwanted behaviour are 74.895% and 65.153% are realised for Intermediate and Secondary Schools.

The ratio for Primary Schools is substantially above 100% (1:1) of the target student's rate of unwanted behaviour (219.670

The ratio for Primary School reduces after interval 30 to less than a 1:1 ratio, indicating it is a protracted management strategy. For Intermediate Schools the ratio increased toward the end of class, and for Secondary it was relatively consistent below a 1:1 ratio throughout class (Figure 5.2.1).

Commentary Table 5.2.10, which shows a ratio of 44.160% between teacher reprimand and behaviour talk to the target student and unwanted behaviour reflects a lack of consistency, contiguity and contingency, parameters associated with the effective suppression of behaviour. This is more for teacher praise for work, be it directed severally to the target student or all students combined, teacher praise occurring at a low rate and student on-task behaviour being the most significant student behaviour.

The ratio between teacher reprimand and behaviour talk and unwanted behaviour combined for Primary School data, which is considerably more than the target student's rate of unwanted behaviour (Figure 5.2.1), may explain the students' higher rates of on-task behaviour given lesser rates of teacher task talk. This ratio, plus the high rate of teacher proximity to the target student (18.215 seconds per minute), combined with minimal praise for work (ratio of 1.586%) may indicate that on-task behaviour is maintained by negative reinforcement, that "compliance (*generally*) may have been under the control of negative reinforcement contingencies," (Shores, Jack, Gunter, Ellis, DeBriere and Wehby, 1993, p.27), for this group of students. The only teacher verbal behaviour in Primary School that exceeds Intermediate and Secondary Schools (seconds per minute) is all teacher reprimand (207/270/271, Tables 5.2.7 and 5.2.9).

Teacher Social Talk

Table 5.2.13 Shows Teacher Social Talk to the Target Student and all Teacher Social Talk Combined for Primary, Intermediate and Secondary Schools. Rates (incidents and seconds per minute) and Correlations with Student On-Task and Unwanted Behaviour across Primary, Intermediate and Secondary Schools

Teacher social talk directed to the target student and combined occurred in almost every interval in Intermediate and Secondary Schools, 1.4 seconds per minute. Less for Primary Schools (0.64 seconds per minute). The only significant relationship found was the small to moderate negative correlation with student unwanted behaviour. This correlation reflects attending to teacher being included as student on-task behaviour. Based on these results, without further differentiation, teacher social talk can be seen as a neutral behaviour.

Table 5.2.13 The Mean Rates (Seconds per Minute) of Teacher Social Talk to the Target Student and the Mean Rates of all Teacher Social Talk Combined for Primary, Intermediate and Secondary Schools

Teacher Social Talk			**Primary**	Correlation			**Intermediate**	Correlation			**Secondary**	Correlation	
			N=6	on-task	unwanted		**N=32**	on-task	unwanted		**N=29**	on-task	unwanted
				behaviour	behaviour			behaviour	behaviour			behaviour	behaviour
		time/min	incidents/min			time/min	incidents/min			time/min	incidents/min		
Social Talk To Target Student	240	0.013	0.053	0.034	-0.156	0.030	0.324	-0.243	-0.170	0.697	0.091	-0.189	0.165
All Teacher Social Talk	204/240/241	0.640	0.789	-0.077	-0.173	1.422	1.000	-0.015	**-0.316**	1.441	0.970	-0.215	0.197

Teacher Proximity to the Target Student

Teacher proximity to students has been found to enhance the effectiveness of both praise (Feldman, 2003; Shores et al., 1993) and reprimand (Pfiffner, O'Leary, Rosen and Sanderson, 1985; Van Houten, Nau, Mackenzie-Keating, Sameoto and Colavecchia, 1982.

Table 5.2.14 The Mean Rate (Seconds and Incidents per Minute) of Teacher Proximity to The Target Student for Primary, Intermediate and Secondary Schools

Teacher Proximity To Target Student (Code: 201):	**Sample Size:**	**Seconds/minute**	**Incidents/minute**
Primary School (year 2-6):	N=6	18.215	0.921
Intermediate School (year 7 and 8):	N=32	9.509	0.971
Secondary School (year 9-13):	N=29	4.536	1.000

Teacher proximity to the target student (seconds per minute) was high across all school types. The mean time reduced by approximately half from Primary to Intermediate School and by half again to Secondary School. Despite the reduction in time, teacher proximity to the target student occurred almost equivalently across schools, occurring once in every 60 second interval (Table 5.2.14).

Table 5.2.15 Correlation Between the Mean Rate (Seconds per Minute) of Teacher Proximity to the Target Student and the Mean Rates of Student On-Task Behaviour, Student Task Talk to Teacher and Teacher Task Talk to the Student for Primary, Intermediate and Secondary Schools

Teacher Proximity To Target Student		**Primary:**	**Intermediate:**	**Secondary:**	**Significance:**
Correlations with teacher and student behaviour:	**Behaviour Code:**	**N=6**	**N=32**	**N=29**	
student on task	301	0.316	0.105	**-0.441**	**P< 0.01**
target student task talks with teacher	302	0.199	-0.216	**0.426**	**P<0.05**
teacher task talk to target student	220	0.086	0.262	**0.844**	**P< 0.001**

Teacher proximity is moderately negatively correlated with student on-task behaviour ($r=-0.441$, $p<0.01$) and positively related with teacher-student ($r=0.844$, $p<0.001$) and student-teacher task talk ($r=0.426$, $p<0.05$) for Secondary students alone.

Table 5.2.16 Correlation Between the Mean Rate (Seconds per Minute) of Teacher Proximity to the Target Student and Mean Rates of Student Unwanted Behaviour for Primary, Intermediate and Secondary Schools

Teacher Proximity To Target Student		**Primary:**	**Intermediate:**	**Secondary:**
Correlation with student unwanted behaviour:		**N=6**	**N=32**	**N=29**
student unwanted or competing behaviour	330/305/6/7/8/	-0.375	-0.080	-0.026

Teacher proximity was not related to student unwanted or competing behaviour across the different school groupings. No significant correlations were obtained between teacher proximity and student on-task or unwanted or competing behaviour, or any particular teacher verbal behaviour (Table 5.2.17).

Table 5.2.17 Correlations between the Mean Rates (Seconds per Minute) of Teacher Proximity to the Target Student and all Teacher Verbal Behaviour Directed to the Target Student, across Primary, Intermediate and Secondary Schools

Teacher Proximity To Target Student		**Primary:**	**Intermediate:**	**Secondary:**	**Significance:**
Correlations with teacher and student behaviour:		**N=6**	**N=32**	**N=29**	
student on task	301	0.316	0.105	**-0.441**	**P< 0.01**
target student task talks with teacher	302	0.168	-0.216	**0.426**	**P<0.05**
target student task talks with other student	320	-0.164	-0.126	0.287	
all student on task behaviour	301/302/320	0.295	0.052	-0.302	
teacher praises work of target student	250	-0.085	0.089	0.301	
teacher praises behaviour of target student	260	0.220	0.109	-0.058	
teacher reprimands target student	270	0.262	0.028	0.094	
teacher task talk to target student	220	0.086	0.262	**0.844**	**P< 0.001**
teacher behaviour talk to target student	230	0.212	-0.262	-0.030	
teacher social talk to target student	240	0.219	0.086	-0.039	
teacher reprimand and behaviour talk to target student	270/230	0.295	-0.183	0.045	
student unwanted or competing behaviour	330/305/6/7/8/340/350/360	-0.375	-0.080	-0.026	
student repetitive movements	308		-0.057	-0.103	

Table 5.2.18 Mean Occurrence (Incidents and Seconds per Minute) of Teacher Proximity and Task Talk to the target Student (Seconds and Incidents per Minute), across Primary, Intermediate and Secondary Schools

Teacher Proximity To Target Student, duration (Seconds)	Code:	Primary:		Intermediate:		Secondary:	
and dispersion of teacher-student behaviour:		seconds/minute	incidents/minute	seconds/minute	incidents/minute	seconds/minute	incidents/minute
proximity	201	18.215	0.921	**9.509**	0.971	**4.536**	1.000
teacher task talk to target student	220	0.750	0.474	1.064	1.000	1.214	0.970
sum of student on task	301/302/320	51.728	1.000	47.284	1.000	46.662	1.000

Teacher proximity to the target student for Primary School is substantially higher than both Intermediate and Secondary Schools but teacher task talk to the target student is least and dispersed over less than half of intervals (Table 5.2.18). These data probably reflect the predominance of group based instruction in Primary School and higher rates of student on-task behaviour for Primary School (51.728 seconds per minute) compared with Intermediate which has some group based instruction and Secondary with no group based instruction (47.284 and 46.662 seconds per minute respectively).

Student unwanted or competing behaviour (Table 5.2.1) was less for Primary School students (1.443 seconds per minute) than for students in Intermediate and Secondary Schools (3.308 and 4.299 seconds per minute respectively).

The high rates (seconds per minute) of teacher proximity to the target student, particularly in Primary School suggests that proximity, if it does have an effect it is as a non-contingent preventative measure (given that teacher reprimands constitutes 70.957 per cent of teacher reprimands and behaviour talk which occurs at the rate of 2.031 seconds per minute (Table 5.2.5)) and or discriminative stimulus for student on-task behaviour. The relationship between teacher proximity and student on-task behaviour is minimal as is the case for Primary and Intermediate Schools, significantly negative for Secondary Schools, or related significantly, as is the case with Secondary School data for teacher–student task talk (Table 5.2.17).

Extended Data for Intermediate Schools

Classroom time and consequently observation period vary considerably between and within Primary, Intermediate and Secondary School classrooms. The range was between 30 minutes and one and a half hours. Data in the current study has been truncated to enable the construction of correlation matrices and endeavour

to maximise the number of sessions and hence students in the study. Data records, involving correlation matrices, have consequently been reduced to 34 minutes in length. Where the 'line' is drawn does matter. This is apparent in comparing Tables 5.2.19 (34 intervals) and 5.2.20 (94 intervals for data from Intermediate Schools). The first 34 intervals are included in the 94 intervals.

Table 5.2.19 Correlations Between the Mean Rates(Seconds per Minute) of Teacher Verbal Behaviour and Student On-Task and Unwanted Behaviour for 34 Intervals for Intermediate School

Behaviour	**Behaviour Code**		**Correlation**	
34 Intervals		seconds per minute	on-task	unwanted
			behaviour	behaviour
student on task	301/302/320	47.284	1.000	**-0.414**
social talk to other student	330	2.758	**-0.384**	**0.948**
all teacher task talk	202/220/221	27.472	**0.384**	**-0.358**
all teacher praise		1.368	-0.158	-0.066
all teacher reprimand and behaviour talk	207/203/270/	2.478	0.080	0.151
student unwanted behaviour	330/304/05/0	3.309	**-0.596**	1.000

Table 5.2.20 Correlations Between Mean Rates (Seconds per Minute) of Teacher Verbal Behaviour and Student On-Task and Unwanted Behaviour for 94 Intervals for Intermediate School

Behaviour	**Behaviour Code**		**Correlation**	
94 Intervals			on-task	unwanted
		seconds per minute	behaviour	behaviour
student on task	301/302/320	28.765	1.000	**0.408**
social talk to other student	330	2.205	**0.399**	**0.959**
all teacher task talk	202/220/221	17.324	**0.967**	**0.451**
all teacher praise	205/250/251/206/260/261	0.924	**0.809**	**0.432**
all teacher reprimand and behaviour talk	207/203/270/230/271/231	1.757	**0.528**	0.284
student unwanted behaviour	330/305/6/7/8/340/350/360	2.673	0.284	1.000

Table 5.2.20 shows significant correlations between student on-task behaviour and all teacher task talk ($r=0.967$, $p<0.001$) and all teacher praise and student on-task behaviour ($r=0.809$, $p<0.001$). Moderate relationships were found between target student social talk to other students ($r=0.399$) and all teacher reprimand and behaviour talk ($r=0.528$). The moderate positive relationships found between student on-task behaviour ($r=0.48$), all teacher task talk ($r=0.451$) and all teacher praise ($r=0.432$) and student unwanted behaviour, rather than appearing incongruous, may reflect relationships associated with the lower rates of student on-task behaviour for the 94 intervals data and student-student social talk.

The relationship between teacher praise for work alone and student on-task behaviour was $r=0.169$ for all teacher praise it was 0.809. Cross correlation, a one

and two interval shift to represent praise as a subsequent event, realised coefficients of 0.813 and 0.839 ($p<0.001$) respectively. This indicates praise to be associated increasingly with student on-task behaviour, however this is also associated with reducing rates of teacher task talk and student on-task behaviour.

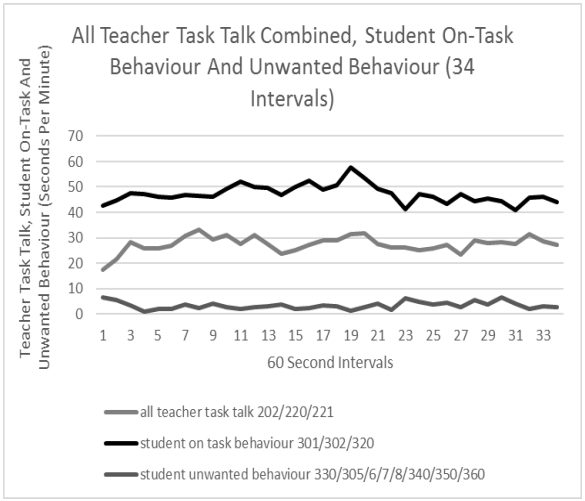


Figure 5.2.2 Mean rates (Seconds per Minute) of All Teacher Task Talk Student On-Task Behaviour and Unwanted Behaviour (34 Intervals

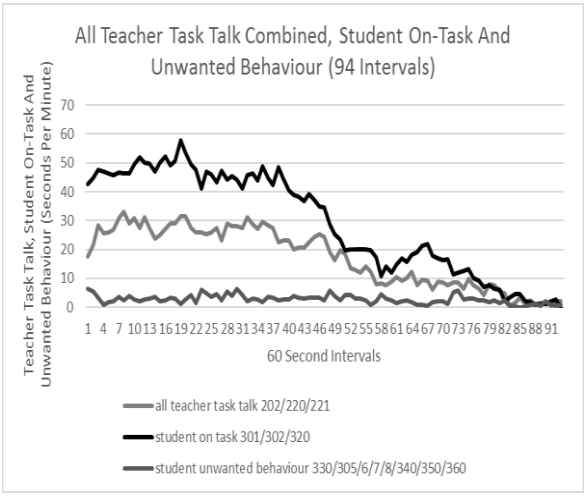


Figure 5.2.3 Figure 5.2.2 Mean Rates (Seconds per Minute) of All Teacher Task Talk, Student On-Task Behaviour and Unwanted Behaviour (94 Intervals)

Figure 5.2.2 shows all teacher task talk, student on-task and unwanted behaviour to be comparatively stable across the 34 intervals. Figure 5.2.3 (94 intervals) shows considerable decline in student on-task behaviour and all teacher task talk at 34 intervals (lesser so for student unwanted behaviour). The correlation coefficient for the respective samples are similarly substantially different.

Commentary Correlations for the shorter series (34 intervals) relate to more active teaching and 'optimal' student functioning than does the inclusion of the additional 58 intervals. The class appears too long for both teachers and students alike. The higher rates of teacher task talk in the first 34 minutes may be prerequisite to establishing the subsequent relationships between teacher task talk and student on-task behaviour given reduced rates of teacher task talk (after c. 40 minutes). The shorter series reflects the period in which the teacher could be said to be actively teaching. This can be seen in the relative times for teacher task talk, all teacher praise and teacher reprimand and behaviour talk between the series and student on-task behaviour. Figure 5.2.3 (Table 5.2.20) shows a strong relationship between student on-task behaviour and the rate of all teacher task talk. For the 34-

interval record (Table 5.2.19) all teacher task talk correlates moderately significantly and positively with student on-task behaviour ($r=0.384$, $p<0.05$) and negatively with student unwanted behaviour ($r=-0.358$, $p<0.01$). The reduction in student on-task behaviour Figure 5.2.3 is not offset by an increase in student unwanted behaviour which indicates the student is simply 'sitting doing nothing.' This protracted hiatus from on-task behaviour and teacher instruction may indicate a consensually agreed pause given a lack in any corresponding unwanted behaviour. The varying correlations may also reflect the greater ratios of teacher task talk and praise to the referent or background behaviour, in that contingency and contiguity of teacher behaviour (association) are more likely. Alternatively, maintaining a significant relationship between all teacher task talk and student on-task behaviour may preclude an increase in unwanted behaviour.

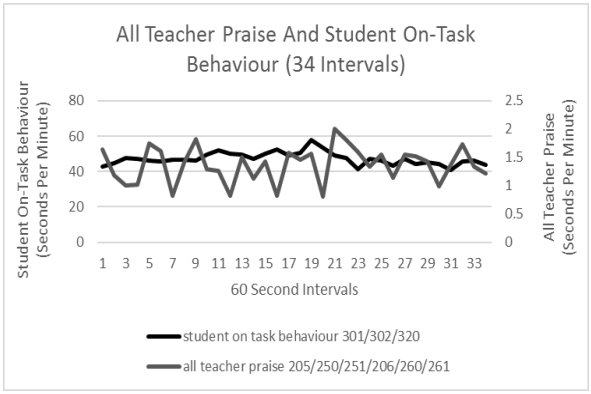


Figure 5.2.4 Mean Occurrence (Seconds per Minute) of All Teacher Praise and Student On-Task Behaviour (34 Intervals)

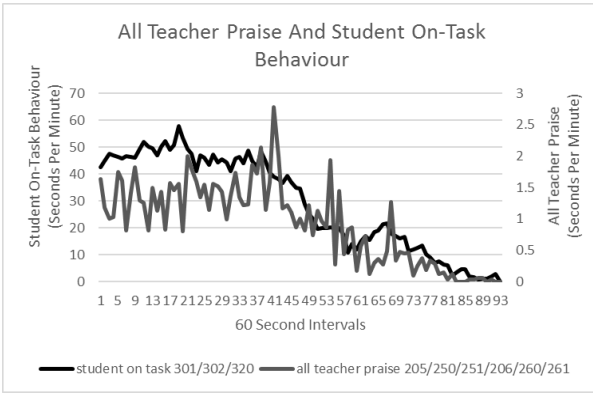


Figure 5.2.5 Mean Occurrence (Seconds per Minute) of All Teacher Praise and Student On-Task Behaviour (94 Intervals)

Table 5.2.21 Correlation Between the Mean Rates (Seconds per Minute) of all Teacher Praise and Teacher Task Talk

Correlation Between All Teacher Task Talk		Correlation
And All Teacher Praise	34 Intervals	-0.182
	94 Intervals	**0.809**

The correlation tables and figures indicate that at certain reduced rate (seconds per minute) of teacher task talk other relations between teacher behaviour and student performance become more pronounced. Given the reducing rates of student on-task behaviour, the new relations (Table 5.2.21) suggest the greater occurrence of praise associated with teacher task talk to be more a factor in containing unwanted behaviour, it does not equate with the effective maintenance of high rates of student on-task behaviour. Analyses in the current study largely

relate to the shorter period of active teacher instruction. The relationship between praise and on-task behaviour is secondary to that of teacher task talk and may be conditional on high rates of teacher task talk preceding this (34 intervals). With variable beginning and end times for all classes, Secondary School and Primary School classes of equivalent duration and Intermediate classes of two thirds greater duration, correlation tables for a majority of the analyses have been truncated to the shorter time period of 34 intervals.

Summary and Discussion

No significant correlations were found between teacher praise for work, praise for behaviour, reprimands, behaviour talk, or social talk addressed to the target student and student on-task behaviour, or for teacher reprimand and behaviour talk combined and student unwanted or competing behaviour for Primary, Intermediate and Secondary Schools. This is unsurprising as teacher interactions with the target student are minimal.

Teacher task talk, reprimand and reprimand and behaviour talk to the target student, despite not relating significantly to student on-task or unwanted or competing behaviour all showed a negative relationship across year levels. This suggests that teacher task talk directed to an individual student detracts from student on-task behaviour as do reprimand and behaviour talk and praise for work.

Juxtaposing unwanted or competing behaviour and teacher reprimand and behaviour talk (cross correlation, lag = 1 interval) resulted in no substantive changes to the respective relationships. Given that reprimand can be more properly seen as a subsequent rather than contiguous event, differences would be more likely to be expected, as would also be the case given teacher latency in reprimanding.

These results question the utility of individual designed and targeted programmes within the classroom setting. Further, the negative relations found indicate increasing specific individually targeted teacher verbal behaviour is unlikely to increase student on-task behaviour or reduce unwanted behaviour.

When the data was combined, teacher task talk (202/220/221) correlated significantly ($r=0.452$, $p<0.01$) with student on-task behaviour (301/302/320) for the Secondary School data and for the Intermediate School data, $r=0.384$, $p<0.05$. Teacher task talk to the whole class alone (202) correlated ($r=0.484$, $p<0.01$ and $r=0.584$, $p<0.001$ respectively) with student on-task behaviour for Intermediate and Secondary Schools. These moderate to large relationships were not repeated for the Primary School data although the values were elevated ($r=0.249$ and $r=0.248$). This lack of relationship at the Primary School level is principally seen as attributable to the lesser rates of teacher task talk to the whole class and all teacher task talk (Table 5.2.3) which is an inherent aspect of group based teaching. That is, the public nature of teacher task talk is circumvented (it is directed principally to small groups of students selectively) and concomitantly any generalised function as a discriminative stimulus for maintaining a task focus reduced. Teacher task talk combined related significantly with student on-task behaviour (a large effect size) for Intermediate School data (94 intervals, $r=0.967$, $p<0.001$) as it did with all teacher praise ($r=0.809$, $p<0.001$). The inclusion of the additional intervals corresponded with a reduction in both teacher task talk and student on-task behaviour, this indicating a stronger relationship as a function of a corresponding reduction in background (referent) behaviour i.e. both teacher task talk and praise being greater relative to student on-task behaviour. The percentage ratios of teacher task talk combined to student on-task behaviour were 58.097 for 34 intervals and 61.766 for the remaining 60 intervals. The large relationship between teacher praise and task talk ($r=0.809$, $p<0.001$) indicates a significant correspondence in occurrence between all teacher task talk and all teacher praise with lower rates of teacher task talk and student on-task behaviour. In the longer data series praise may be related to student on-task behaviour only due to its association with the lesser rate of teacher task talk. This finding, none the less, supports that research indicating praise to be positively related to student on-task behaviour, however, it does not support the belief that increasing praise will increase student on-task behaviour. These results also suggest that 40 minutes is the characteristic time for which teachers can maintain a high rate of task talk.

For the truncated data (34 intervals) teacher praise for work directed toward the target student (250) did not relate with student on-task behaviour. Obtained

relationships across Primary, Intermediate and Secondary Schools, severally and combined, were all negative. This finding could be attributable to teacher praise being a distraction from on-task behaviour that results in protracted time off task prior to reorientation to task given higher rates of teacher task talk or possibly the negative connotations deriving from this – the neutral relationships between praise for work and behaviour and teacher proximity for Primary and Intermediate Schools indicate that praise is equally likely to be of public or private nature. No relationship was found for teacher praise for work to the target student for Secondary Schools and student on-task behaviour.

The principal differences between the Primary School combined data, and the Intermediate and Secondary School combined data, are a lower rate (seconds per minute) of teacher task talk, higher rate of teacher task talk to individual students than to the whole class, higher rate of teacher reprimands, greater teacher proximity, and a higher level of student on-task behaviour. Attending to the teacher is a likely response to reprimand and may have inflated student on-task behaviour for the Primary School group. The data for Intermediate (34 intervals) and Secondary Schools are consistent with the hypothesis that a relationship exists between low rates of teacher task talk greater reprimand and less student on-task behaviour, that this weakens or makes non-existent the relationship between student on-task behaviour and teacher task talk. The Primary School data indicates that factors other than teacher task talk are related to student on-task and unwanted behaviour. Additional analyses indicated that the variance from this in the Primary School data could be attributable to the predominance of group based instruction, the frequent use of 'mat time,' the discrete 'remote control' of non-group students this necessitates, the relative lesser rate of teacher task talk, and greater rates of reprimand and teacher proximity, (Table 5.2.5). When the ratio of teacher reprimand and behaviour talk combined (to the whole class, to the target student and to other students summed (Tables 5.2.10, 5.2.11, 5.2.12) to student unwanted behaviour is considered, ratios of teacher reprimand and behaviour talk to student unwanted behaviour are 74.895% and 65.153% are realised for Intermediate and Secondary Schools. The ratio for Primary Schools is substantially above 100% (1:1) of the target student's unwanted behaviour (219.670%). This ratio, which is considerably more than the target student's rate of unwanted behaviour is likely the

predominant and necessary element in maintaining order with non-group students during group instruction. This ratio, plus the high rate of teacher proximity to the target student (18.215 seconds per minute), combined with minimal praise for work (ratio of 1.586%) indicates that on-task behaviour is maintained by negative reinforcement, that "compliance (*generally*) may have been under the control of negative reinforcement contingencies," (Shores, Jack, Gunter, Ellis, DeBriere and Wehby, 1993, p.27), for this group of students. That for Primary School students with group based teaching formats, the greater focus on teaching classroom protocol and a task focus is achieved through maintaining an overarching negative reinforcement ambience in conjunction with maintaining high rates of teacher proximity.

The lack of, or negative relationships (teacher task talk) between teacher verbal behaviour toward the target student and student on-task and unwanted behaviour emphasises the relationships found between teacher task talk to all targets combined and the differentiations of that that reflect greater accessibility by the target student. These differentiations are shown in the following table.

Table 5.2.22 Correlations between the Mean Rates (Seconds per Minute) of Teacher Task Talk Differentiated and Student On-task and Unwanted behaviour, Alpha levels and Standard Deviations for Intermediate and Secondary Schools

Correlation coefficients, alpha levels, means and standard deviations for Intermediate and Secondary Schools		**Intermediate**	**School**	**Secondary**	**School**		
teacher task talk to all targets combined	202/220/221 with:		alpha level		alpha level	mean	std. deviation
student on-task behaviour	301/302/320	0.384	0.050	0.452	0.020	0.418	0.048
	student unwanted behaviour	-0.358	0.050	-0.556	0.010	-0.457	0.140
teacher task talk to whole class	202 with:						
student on-task behaviour	301/302/320	0.484	0.010	0.585	0.010	0.535	0.071
student working and attending to teacher	301	0.534	0.010	0.515	0.010	0.525	0.013
	student unwanted behaviour	-0.548	0.010	-0.674	0.001	-0.611	0.089

Table 5.2.22 shows moderate to large relationships between teacher task talk to the whole class (202) and both student on-task behaviour and student unwanted behaviour, particularly when student on-task behaviour is also differentiated to reflect working and attending to the teacher (301). All relationships and effects sizes are large, ranging from r=0.515 to -0.674 and $p<0.01$ to 0.001. These results support the overarching hypothesis (Hypothesis $H_{overarching}$) that increasing the rate of teacher task talk that is public (accessible to the target student) improves student functioning within the classroom. This more so than

would a teacher-student focus alone. Results show the data to be clustered around the mean.

The moderate to large relationships found between all teacher task talk and student on-task behaviour (Table 5.2.4) for Intermediate and Secondary School data support the hypothesis that, a high rate of teacher task talk would be associated with a high rate of student on-task behaviour (Hypothesis H_1)**.**

The significant negative correlations obtained between all teacher task talk and student unwanted behaviour for Intermediate and Secondary School data are consistent with the hypothesis (Hypothesis H_2) that the greater the rate of task talk, the greater rates of on-task behaviour and lesser rates of unwanted behaviour will be realised. When the data are differentiated and relationships ascertained between teacher task talk to the whole class (202) and student working and attending (301, Table 5.2.6, 5.2.22) stronger relationships are found in support of Hypothesis H_1**.** These results reflect the more public (accessible to the student) elements of teacher task talk and student response to this. The data for Primary Schools although elevated and of similar valence, do not indicate a similar relationship exists (Table 5.2.4). When reprimands and behaviour talk are considered separately, the results indicated that teacher behaviour talk is greater for Intermediate and Secondary Schools than reprimands and can perhaps be seen as supplanting reprimands – older students being more reasonable with. Additionally, student unwanted or competing behaviour which is mainly constituted of student social talk to other students (330) increases over Intermediate and Secondary Schools relative to Primary School (Table 5.2.7) the reduction or containment of which may be seen as being more amenable to reason.

The relationships obtained indicate that teacher whole class instruction and overall task talk relate more significantly to student on-task behaviour and unwanted behaviour than does a more targeted student direction of teacher task talk.

Teacher proximity to the target student (seconds per minute) was high across all school types. The mean time reduced by approximately half from Primary to Intermediate School and by half again to Secondary School. Despite the reduction, teacher proximity to the target student occurred almost equivalently

(incidents per minute) across schools, occurring at least once every 60 second interval.

Teacher proximity is moderately negatively related with student on-task behaviour ($r=-0.441$, $p<0.01$) and positively related with teacher–student ($r=0.844$, $p<0.001$) and student–teacher task talk ($r=0.426$, $p<0.05$) for Secondary students alone. The negative correlation may indicate a distraction effect, possibly an artefact of student awareness of teacher proximity.

Teacher proximity was not related to unwanted or competing behaviour across the different school groupings.

The high rates (seconds per minute) of teacher proximity to the target student, particularly age based suggests that proximity functions as a non-contingent proactive or preventative measure. The relationship with student on-task behaviour is minimal or significantly negative, or related, as is the case with Secondary School data, specifically to teacher–student task talk.

These results were not expected. Teacher proximity to the target student is a simply effected strategy that has been shown to enhance classroom management – ‘‘teacher movement in the classroom may effectively control student disruptions by bringing the teacher into closer proximity to all students, thereby increasing the effectiveness of their interactions with students’’ (Gunter, Shores, Jack, Rasmussen and Flowers (1995) p.12). Teacher proximity has been shown to enhance overall student management (Gunter, Shores and Jack, 1992; Gunter, Shores, et al., 1995) and to make praise and reprimand more effective (Van Houten et al, 1982; Pfiffner et al., 1985 and Forehand et al.,1987). Frequent teacher movement patterns around the classroom, of which teacher proximity in part reflects has also been shown to enhance classroom management (Evertson, 1989; Lewis and Sugai, 1999; Shores, Jack et al., 1993; Gunter, Shores et al., 1995).

At a certain rate (seconds per minute) for the truncated series characterised by high rates of teacher task talk and student on-task behaviour, teacher task talk to the whole class separately and combined, loses the relationship with student on-task behaviour and other factors become prescriptive or defining of classroom behaviour

(such as non-contingent teacher proximity and a high rate of class-wide reprimand). No relationships were found for teacher task talk to the target student and to other students combined for Primary Schools despite teacher task talk to all students being of greater rate (seconds per minute) than for the other (Intermediate and Secondary) school data (Table 5.2.2). Teacher whole-class instruction was moderately related to student on-task behaviour whereas a more targeted student direction of task talk, as is in Primary Schools, was not.

Inherent in these results is the retention of a classroom task-related focus for all students, the retention of teacher visibility and, hence, teacher behaviour having a generalised effect on retaining high rates of student on-task behaviour which implicitly reduces rates of unwanted or competing behaviour.

More definitive results could have been realised given further differentiation within the student on-task behaviour category, such that student attention was differentiated according to function such as work-related, praise, reprimand, social talk or other, rather than being all encompassing.

5.3 All Data Combined (N= 72)

Introduction

Teacher verbal behaviour within the classroom is predominantly instructional sequences or academic talk, that is, task talk (Galton, Simon, & Croll, 1980; Shores, 1993; Shores, Jack et al., 1993; Wehby, Symons & Shores, 1995; Wehby and Yoder, 2002). Teacher task talk is defining of student attention and application to task. The predominant student behaviour within the classroom is on-task behaviour. Teacher talk is most often directed at the entire class and less frequently at individual members of the class. (Bellack & Kleibard, 1966). Galizio (1979); Hayes, Brownstein and Kern (1986); Hackenberg and Joher (1994) and Schmitt (1998), have suggested that instructional control or compliance with instruction to be more than a function of the relationship between the instruction and the contingencies. Fantino, (2004) sees most student behaviour within the

classroom as rule-governed and this "rule governed (that is, instructed) behavior is often less sensitive to changes in environmental contingencies than is contingency-shaped behaviour". p.281. Carr (1994) suggested a greater focus on the social context in which behaviour occurred to be necessary in ascertaining other functional relations and bringing about greater congruity between descriptive and functional analyses of behaviour, that relations other than the specific response-consequent relation should be included in descriptive analyses. The current study (Sections 5.1 and 5.2) has assessed the relationship of teacher verbal behaviour, or teacher task talk in particular, with student on-task and unwanted behaviour. Results indicate a teacher-individual student focus does not relate to student on-task or unwanted behaviour in the expected direction whereas a teacher whole class focus, or all task talk combined does.

All data was combined (Primary, Intermediate and Secondary School data) to gain an overall view of teacher–student behaviour in the classroom.

The purpose of the present study was to use descriptive analysis to look at the relationship of rates of teacher task talk and the effectiveness of social consequences (positive and negative) in maintaining appropriate task and social performance on this base in respect to a target child in classroom settings. The principal tenet is that if teacher talk is task or activity specific and this focus is frequent, ongoing, and public (pervasive), this defines the situation, behavioural expectation and student performance. It defines the context of the learning environment in a functional goal directed manner and this more so than that realised from an individual teacher – student focus. Combining all data enables a more robust analysis of these relations than was possible in Sections 5.1 and 5.2.

The results were expected to confirm the principal tenets in the hypotheses:

Hypothesis $H_{overarching}$ The overarching hypothesis is that increasing the rate of teacher task talk that is public (accessible to the target student) improves student functioning within the classroom. This more so than would a teacher-student focus alone.

Hypothesis H_1 A high rate of teacher task talk would be associated with a high rate of student on-task behaviour**.** High rates of teacher task talk are both discriminative stimuli for students gaining and maintaining task orientation, and are prescriptive or defining of the contingency operating for student attention and behaviour. *This would be evident in a significant positive correlation between the independent variables, the rate of teacher task talk to the whole class (202) and combined (202/220/221) and the dependent variable, student on-task behaviour (301/302/320).*

Hypothesis H_2 A high rate of teacher task talk would be associated with reduced rates of student unwanted or competing behaviour. Competing or unwanted behaviour, such as talking with peers, would be expected to be more manifest in the 'void' created by less teacher task talk. *This would be evident in a significant negative correlation between the independent variable, teacher task talk to the whole class (202) and combined (202/220/221), and the dependent variable, student unwanted or competing behaviour.*

Hypothesis H_3 A high rate of teacher task talk is the defining condition under which reprimands and behaviour talk reduce student unwanted or competing behaviour and maintain a high rate of student on-task behaviour. *This would be evident in fewer reprimands and behaviour talk, in reprimands and behaviour talk being of shorter duration, greater association of reprimand and behaviour talk with unwanted behaviour, and subsequently, a significant negative relationship between teacher reprimands and behaviour talk and student unwanted behaviour, and a significant positive relationship with student on-task behaviour, for those teachers evidencing high rates of teacher task talk. This indicating a conditional functional relationship.*

Reprimand and behaviour talk are analysed severally and combined. Behaviour talk, or talk about conduct, is often sequalae to, or is used as an alternative to reprimand.

Hypothesis H_4 A high rate of teacher task talk would be associated with a high rate of student on-task behaviour and with praise being significantly related to both variables. *This would be evident in a significant positive correlation*

between teacher praise and student on-task behaviour given a high rate of teacher task talk. That is a conditional functional relationship.

Method

Subjects Participants were teachers and students within 'mainstream' schools across different year levels (years 2–13).

Classes recorded in Primary and Intermediate Schools were mainly general in nature (reading writing arithmetic and or topic based (one art class). Subjects recorded in the Secondary School included mathematics, English and religious studies.

Twenty-six teachers participated in the study. Years teaching experience ranged from 4 to 43 years, the mean was 16.9 years, median 15 years. 62 students participated, six were Primary School students, 32 were Intermediate School and 24 Secondary School.

The research was focused on observing and describing teacher practice during the course of normal classroom interactions and tasks and student responses to these.

There was no necessity to personally identify either teachers, students or classes. School identities were retained simply for ease of recognition.

Participation was voluntary.

Setting The settings were general education classrooms in Primary and Intermediate Schools in the Hastings and Napier areas in State Schools and in a State Integrated Secondary School.

Three Primary Schools participated (deciles 2, 3 and 1) year levels 1 to 6; ages 5 years to 11 years two of which included year levels 7 and 8; two Intermediate Schools (decile 2 and 8; year levels 7 and 8; ages 11 years to 12 years) and one Secondary School (decile 4; levels 9 to 13; ages 13 to 18). The schools selected include a range of students from varying socio-economic backgrounds.

The Secondary School was a State Integrated (i.e. state funded) religion-based single sex (male) school.

Procedure The procedure followed involved videoing classrooms during normal teacher classroom instruction (Section 2.3).

Data Collection For the current analysis, the data relating to teacher praise, reprimands, behaviour talk, task talk, social talk, teacher proximity and student on-task behaviour and unwanted behaviour from all year levels were combined. All Figures and Tables represent the mean values for all the data combined. Correlation matrices were constructed from this data.

Behaviour observation codes are described in Section 2.7, inter-observer agreement in Section 2.9 and Section 4.1 of the Results Section.

The results were used to inform further analysis.

Data Analysis Behaviour observation codes are described in Section 2.7, inter-observer agreement in Section 2.9 and Section 4.1 of the Results Section. Agreement was calculated by dividing the number of agreements by the number of agreements and disagreements and multiplying by 100. Mean occurrence agreement for the dependent and independent variables was 97.65%, and median 98.99%.

The proportion of teacher task talk relative to other teacher verbal behaviour (Hypothesis H_1) was the primary measure of the independent variable.

The on-task and unwanted behaviour of the target child is taken as a proxy measure of class performance (the dependent variable). Student off task behaviour was not measured as it is the reciprocal of on-task behaviour. Student unwanted behaviour includes social talk to other students, disruptive behaviour, aggression, abuse etc., as outlined in the Section relating to behaviour definitions (Section 2.7). The direction, or target, of teacher and student behaviour are measured, for example, teacher task talk to the target student, to other students and to the whole

class, the direction or target of student behaviour is toward the teacher or other students. The combined data was truncated (made of equal interval length) to enable correlation tables to be completed and independent variables correlated with dependent variables. Primary correlation tables were constructed using seconds per minute data alone which was summed within 60 second intervals and averaged across all recorded sessions (N=72). This measure included all data from within-session real-time recordings and represents all data recorded on a continuous basis. This enables a more accurate analysis of the temporal relationships between the independent and dependent variables (Rapp et al., 2001), than would be found in temporally discontinuous or interval recording ('incidence per minute' in this study). Teacher behaviour was correlated with on-task behaviour and unwanted or competing behaviour (all correlations are two-tailed tests). Cross correlations were calculated in order to assess the behaviour- subsequent event nature of the respective independent and dependent variables. Contiguous correlations do not show the temporal relations e.g. teacher praise succeeding student on-task behaviour and reprimand succeeding student unwanted behaviour. The optimal correlation between these variables indicates the time taken for the effect to impact on the value of the other or the protracted nature or otherwise of the independent variable. Percentages of teacher praise and reprimand were calculated relative to student on-task and unwanted behaviour respectively to deduce the occurrence of these compared with the referent or background occurrence.

Truncating the data resulted in data for Intermediate School indicating a relationship between teacher praise and student on-task behaviour, albeit with reducing rates of student on-task behaviour, being omitted. The cut-off for this is after the period in which student on-task behaviour and teacher task talk are at high rates, the included (truncated) data represents the period in which the teacher could be said to be actively teaching (Section 5.2).

All Figures and Tables represent the mean values for those particular analyses (N=72). Correlation matrices were constructed from this data.

Results

Student On-Task Behaviour

Table 5.3.1 The Mean Occurrence (Seconds per Minute) of Student On-Task Behaviour for All Data Combined (N=72)

Behaviour:	**Code:**	**correlation:**			
		301	**302**	**320**	**301/302/320**
student on task	301	1	**-0.46**	**-0.40**	**0.96**
student task talk to teacher	302	**-0.458**	1	0.275	**-0.310**
student task talk to other student	320	**-0.399**	0.275	1	-0.141
all student on task behaviour	301/302/320	**0.958**	**-0.310**	-0.14102	1

Negative correlations, moderate to large relationships and effect sizes) were obtained between student on-task behaviour (301) and student task talk to teacher ($r=-0.467$, $p<0.001$) and student task talk to another student/s ($r=-0.346$, $p<0.01$). Both results (Table 5.3.1) indicate the relative independence of the categories (behaviour) in recording. Throughout the analyses (5.1 and 5.2) student on-task behaviour (301) has correlated more with teacher task talk than has the combination of student on-task behaviour (301/302/320). The combination of student on-task behaviour (301/302/320) has been employed more in analyses, the differences as can be seen in table 5.3.2 are not generally substantial.

Table 5.3.2 Correlations of Mean Rates (Incidents and Seconds per Minute) between ,Teacher Task Talk Differentiated and Combined, and Student On-Task Behaviour Differentiated and Combined

				Correlation With Student On Task Behaviour:			
Teacher Behaviour:	**Code:**	**seconds/minute**	**incidents/minute**	301	302	320	301/302/320
teacher task talk to whole class	202	15.495	1	**0.719**	**-0.258**	**-0.266**	**0.704**
teacher task talk to the target student	220	1.048	1	**-0.519**	**0.685**	**0.479**	**-0.364**
teacher task talk to other students	221	11.090	1	**-0.477**	**0.213**	**0.471**	**-0.381**
all teacher task talk	202/220/221	27.633	1	**0.320**	0.086	**0.301**	**0.454**

All differentiated categories of teacher task talk occurred at least once per 60 second interval (Table 5.3.2). Teacher task talk to the whole class being more than twice the amount of task talk to the target student and other students combined. The target student may or may not have been privy to teacher task talk to other students, this often being private phenomena, however teacher task talk to the whole class and other students is considerably greater than that directed to the target student. The latter constituting 3.792 per cent of all teacher task talk.

Moderate negative correlations were found between teacher task talk to the target student (220, r=-0.364, p<0.01) and other students (221, r=-0.381, p<0.01) and student on-task behaviour (301/302/320). A large relationship and effect size was found with teacher task talk to the whole class (202, r=0.719, p<0.001) with student on-task behaviour (301) and r=0.703 (p<0.001) with all student on-task behaviour (301/302/320). This relationship reflects teacher task talk that is completely public in nature. A moderate to large effect was found with all teacher task talk (202/220/221, r=0.454, p<0.001) with all student on-task behaviour (301/302/320). The former category reflects teacher task talk that was public in nature (to the whole class), the latter incorporates teacher task talk to other students which may be indiscernible to the target student.

Commentary The negative correlation obtained between teacher task talk directed to the target student and student on-task behaviour is consistent with results from previous Sections (5.1 and 5.2). These results, plus the negative correlation with teacher task talk to other students, indicate, rather than adding incrementally to student on-task behaviour they are subtracting from it.

The relationship between teacher task talk to the whole class (202) and all teacher task talk (202/220/221) is significantly related (r=0.703, p<0.001 and r=0.454, p<0.001 respectively) to all student on-task behaviour (301/302/320). This data (a large effect size) strongly support a class-wide focus over an individual teacher-student focus in maintaining high rates of student on-task behaviour.

The Hypothesis H_1, that there is a relationship between the rate of teacher task talk and student on-task behaviour in classroom settings are supported by The results in this section.

Hypothesis H_1 A high rate of teacher task talk would be associated with a high rate of student on-task behaviour. High rates of teacher task talk are both discriminative stimuli for gaining and maintaining task orientation, are prescriptive or defining of the contingency operating for student attention and behaviour. *This would be evident in a significant positive correlation between the rate of teacher task talk to the whole class (202) and combined (202/220/221) and student on-task behaviour (301) and on-task behaviour combined (301/302/320).*

Teacher Task Talk and Student Unwanted Behaviour

Table 5.3.3 Mean Rates (Incidents and Seconds per Minute) and Correlations of Teacher Task Talk Differentiated and Combined and Student Unwanted Behaviour for all data Combined (N=72)

N=72					
Behaviour:	**Behaviour code:**	**seconds/minute**	**incidents/minute**	**correlation:**	**significance:**
student unwanted or competing behaviour	330/304/5/6/7/8/340/350/360	3.386	1	1	
teacher task talk to whole class	202	15.495	1	**-0.572**	**P< 0.001**
teacher task talk to target student	220	1.048	1	0.156	
teacher task talk to other students	221	11.090	1	0.232	
all teacher task talk	202/220/221	27.633	1	**-0.499**	**P< 0.001**

Teacher task talk to the whole class and all teacher task talk combined correlated significantly and negatively with student unwanted or competing behaviour (Table 5.3.3), these indicating a moderate effect size. The correlation between teacher task talk to other students (221, r=0.232) and student unwanted or competing behaviour was not significant.

Reciprocal Teacher-Student Task Talk -Teacher Task Talk to The Target Student

A high correspondence was found between teacher task talk to the target student and target student task talk to the teacher (r=0.685, P < 0.001). A moderate negative relationship was found between teacher task talk to the target student (r=-0.364, p< 0.01) and student on-task behaviour (301/302/320). Target student task talk to the teacher correlated r=-0.310, p< 0.05 with student on-task behaviour. Juxtaposing the data to show student behaviour after teacher task talk r=-0.344, p<0.01. Repeating for student on-task behaviour alone (301), r=-0.425, p< 0.001. These results indicate a moderate deleterious effect of both teacher and student reciprocal task talk on ongoing student on-task behaviour.

The insignificant correlation obtained between teacher task talk to the target student and student unwanted behaviour (220, r=0.156) is reflected in the negative correlation found between teacher task talk to the target student and student on-task behaviour severally (301) and combined (301/302/320, Table 5.3.2, r=-0.519 and r=-0.364, p< 0.01).

Commentary The correlations between teacher task talk to the target student and other students and student unwanted behaviour suggests a tendency for student unwanted behaviour to increase given teacher 'distraction' or involvement with other students.

Teacher task talk to the whole class (202) and all teacher task talk (202/220/221) is significantly related ($r=-0.572$, $p<0.001$ and $r=0.-499$, $p<0.001$ respectively) to all student unwanted or competing behaviour (330/304//5/6/7/8/340/350/360). These results show large relationships and effect sizes. These results support Hypothesis H_2.

Hypothesis H_2 A high rate of teacher task talk would be associated with reduced rates of student unwanted or competing behaviour. Competing or unwanted behaviour, such as talking with peers, would be expected to be more manifest in this 'void' of lesser teacher task talk. This would be evident in a large significant negative correlation between teacher task talk to the whole class (202) and combined (202/220/221), and student unwanted or competing behaviour.

This data strongly supports a class-wide focus over an individual teacher–student focus in maintaining low rates of student unwanted or competing behaviour.

The overarching hypothesis **(**$H_{overarching}$) can be upheld, that increasing the rate of teacher task talk that is public (accessible to the target student) improves student functioning within the classroom. This more so than would a teacher-student focus alone.

Teacher Proximity to the Target Student

Table 5.3.4 Correlation between the Mean Rates (Incident and Seconds per Minute) of Teacher Behaviour Directed to the Target Student and Mean Rates of Teacher Proximity to the Target Student, N=72

N=72					
Behaviour:	**Behaviour Code:**	**Seconds**	**incidents**	**correlation:**	**Significance:**
		per minute	**per minute**		
Teacher Proximity	**201**	**8.077**	**1**		
student on task	301	43.674	1.000	0.085	
student task talk to teacher	302	0.524	1.000	-0.046	
student task talk to other students	320	1.380	1.000	-0.016	
sum of student on task	301/302/320	45.579	1.000	0.085	
teacher praise target student for work	250	0.050	0.909	-0.059	
teacher praises student for behaviour	260	0.014	0.545	-0.174	
teacher reprimands target student	270	0.063	0.909	0.114	
teacher task talk to target student	220	1.048	1.000	0.068	
teacher behaviour talk to target student	230	0.074	0.848	**-0.350**	**P<0.01**
teacher social talk to target student	240	0.025	0.455		
teacher reprimand and behaviour talk to target student	270/230	0.136	1.000	-0.206	
student unwanted or competing behaviour	330/304/305/306/307/				
	308/340/350/360	3.386	1.000	-0.104	
student repetitive movements	308	0.056	0.303	**-0.441**	**P<0.001**

Table 5.3.5 The Mean Rates (Incidents and Seconds per Minute) for Teacher Proximity to the Target Student.

N=72		Seconds/minute	Incidents/minute
Teacher Proximity	201	8.077	1

The only significant correlations between target student behaviour and teacher proximity to them (Table 5.3.4) were the moderate relationships with teacher behaviour talk ($r=-0.350$, $p<0.01$) and student repetitive movements ($r=0.440$, $p<0.001$). These results, moderate relationship and effects sizes, indicate that behaviour talk to the target student was more likely detached or public in nature and that repetitive movements were more likely to occur the more distant the teacher.

Commentary The lack of significant correlations between teacher proximity to the target student and other teacher–student directed behaviour indicates that teacher proximity is generally not used as a specific management strategy. This is surprising as it occurred over 8 seconds per minute across all 60 second intervals (Table 5.3.5).

Teacher Reprimand and Behaviour Talk Directed to the Target Student

Table 5.3.6 Correlations between the Mean Rates (Seconds per Minute) of Teacher Reprimands and Behaviour Talk to the Target Student and Unwanted Behaviour, with and without a One Interval Lag on the Mean Rate of Teacher Reprimands and Behaviour Talk

Correlation Between Teacher Reprimand And Behaviour	270/230		
Talk And Unwanted or Competing Behaviour:	330/304/5/6/7/8/340/350/360	**Correlation:**	**Significance:**
no lag		0.064	
one interval lag on reprimands and behaviour (270/230)		**0.467**	**P< 0.001**

The correlation between teacher reprimand and behaviour talk to the target student (270/230) for real time data was near zero. A one interval lag on reprimand and behaviour talk realised a significant positive relationship ($r=0.467$, $p<0.001$), this shows a moderate to large effect size for the level of congruence between the two behaviours (Table 5.3.6).

Table 5.3.7 Correlations between the Mean Rates (Incidents and Seconds per Minute) of Teacher Reprimands and Behaviour Talk, all Teacher Praise and Unwanted and the Mean Rate of Student On-Task Behaviour for all Data Combined

N=72				**Correlation with**	
Behaviour:	**Code:**	**Seconds/minute**	**Incidents/minute**	**on-task behaviour:**	**Significance:**
student on task behaviour	301/302/320	45.579	1		
teacher reprimands target student	270	0.063	0.909	-0.114	
teacher behaviour talk to target student	230	0.074	0.848	**-0.301**	P< 0.02
reprimand and behaviour talk to target student	270/230	0.136	1	**-0.307**	P< 0.02
sum of teacher reprimands and behaviour talk	207/203/270/230/271/231	2.460	1	0.005	
student unwanted or competing behaviour	330/305/6/7/8/340/350/360	1.129	1	**-0.568**	P< 0.001
all teacher praise	205/250/251/206/260/261	1.128	1	0.061	
all teacher praise to target student	250/260	0.064	0.909	**-0.485**	P< 0.001

No significant relationships were evident (Table 5.3.7) between all teacher praise (205/250/251/206/260/261) and the sum of teacher reprimands and behaviour talk 207/203/270/230/271/231) and student on-task behaviour (301/302/320) that would suggest a reciprocal relationship. Student on-task behaviour correlated significantly with student unwanted behaviour or competing behaviour ($r=-0.568$, $p<0.001$, Table 5.3.7), this representing a large negative relationship.

Teacher reprimand and behaviour talk (270/230) to the target student and all teacher praise for work and behaviour were moderately related ($r=0.309$, $p< 0.02$), the relationship between all teacher reprimand and behaviour talk and all

teacher praise was not significant (r=0.116). The negative relationships found for teacher praise for work and behaviour to the target student and teacher reprimand and behaviour talk to the target student and student on-task behaviour indicates (Table 5.3.7) both behaviours move in the same direction to a moderate extent this indicating an almost paradoxical phenomenon. It is however consistent with the correlations for the same behaviour found in Section 5.1 with respect to incidence.

Table 5.3.8 Correlations between the Mean Occurrence of Teacher Reprimand of The Target Student with the Mean Rates of Student Unwanted Behaviour and Student On-Task Behaviour with Lags on Teacher Reprimands (Seconds per Minute)

N=72	real time	one interval	two interval	three interval	four interval
Teacher Reprimand Of The Target Student (270)	recording	lag on	lag on	lag on	lag on
		reprimands	reprimands	reprimands	reprimands
	0	-1	-2	-3	-4
correlation reprimand and unwanted behaviour	0.136	**0.398**	0.141	0.044	0.108
correlation reprimand and on task behaviour	-0.114	-0.216	0.000	0.076	-0.022

The moderate relationship found with a one interval lag on reprimands to the target student and student unwanted or competing behaviour (r=0.398, p<0.01), is less than when teacher reprimand to the target student (270) is combined with teacher behaviour talk (230) to the target student (270/230, r=0.467, p<0.001, Table 5.3.6).

Point 0 represents correlations of the respective behaviour as recorded, that is, reprimand as a subsequent event, and negligible correlations with unwanted or competing behaviour and student on-task behaviour.

Point -1 represents a one interval lag on teacher reprimands to the target student and as such depicts student unwanted or competing behaviour and student on-task behaviour contiguous with teacher reprimands. That is, it represents the congruity of teacher reprimands to the target student with student on-task behaviour and student unwanted or competing behaviour. The moderate relationship obtained (r=0.398, p<0.01) indicates congruity between teacher reprimands and student unwanted behaviour. The elevated but small negative correlation (r=-0.216) between teacher reprimands and student on-task behaviour is consistent with an expected suppression effect on student unwanted behaviour.

Point -2 represents a two-interval lag on teacher reprimands to the target student and as such the correlation reflects any change in student on-task or unwanted or competing behaviour as a function of the teacher reprimands.

That the correlation between teacher reprimands and student unwanted behaviour has not become negative two intervals after Point 3 indicates that teacher reprimands have not effected a significant suppression of student unwanted or competing behaviour nor an increase in student on-task behaviour.

Point -3 shows the maximal correlation between teacher reprimand and student on-task behaviour and student unwanted behaviour after the reprimands occurring. At no point were teacher reprimands negatively correlated with student unwanted or competing behaviour.

Commentary Teacher reprimands to the target student occurred 0.063 seconds per minute, student unwanted or competing behaviour 1.128 seconds per minute. The sum of teacher reprimands and behaviour talk (to the class, the target student and other students) occurred at a rate of 2.46 seconds per minute which is substantially greater than reprimands directed to the target student and hence would appear more likely to function as a locus of control.

Reprimand and behaviour talk to the whole class, to the target student and to other students combined has related more strongly with both student on-task behaviour and student unwanted behaviour than reprimands alone or reprimand and behaviour talk to the target student across all analyses.

Juxtaposing reprimand by one interval such that it could be directly correlated with student unwanted and on-task behaviour indicates a significant correlation, this showing congruity of occurrence between the two behaviours. This coincides with a suppression effect (negative relationship with) on student on-task behaviour. A further one interval lag to show relationships following reprimand indicates that teacher reprimands have not effected a significant suppression of student unwanted or competing behaviour nor an increase in student on-task behaviour. At no time does the relationship between teacher reprimand and student unwanted behaviour become negative nor the relationship with student on-task

behaviour become positive. These results indicate an individual focus to be only minimally effective in respect to teacher reprimand.

The moderate relationship obtained with a one interval lag on reprimands to the target student and student unwanted or competing behaviour ($r=0.398$, $p< 0.01$), is less than when teacher reprimand to the target student (270) is combined with teacher behaviour talk to the target student (270/273, $r=0.467$, $p< 0.001$, Table 5.3.6 and 5.3.8). This may reflect the public nature of teacher behaviour talk (230, Table 5.3.4) to the target student indicated by the negative moderate relation ($r=-0.349$, $p<0.01$) between teacher behaviour talk to the target student and teacher proximity to them.

Teacher Reprimand and Behaviour Talk to All Targets Combined and Student On-Task and Unwanted Behaviour

The differences in relationships between real time recording of all teacher reprimand and behaviour talk (to the whole class, to the target student and to other students) and student unwanted or competing behaviour and the same data with a one interval lag on all teacher reprimands and behaviour talk are depicted in Table 5.3.9

All teacher reprimand and behaviour talk to the whole class, the target student, and other students relate with student unwanted behaviour for real time data ($r=0.248$, $p<0.05$, Table 5.3.9). A one interval lag on the sum of teacher reprimands and behaviour talk indicate a large relationship and effect size ($r=0.622$, $p<0.001$) with student unwanted behaviour (Figure 5.3.9). This juxtaposition of data (lag=1) shows a high rate of reprimand and behaviour talk corresponding to unwanted or competing behaviour.

Table 5.3.9 Correlations between the Mean Rate (Seconds per Minute) of all Teacher Reprimand and Behaviour Talk and the Mean Rates of Student Unwanted Behaviour and Student On-Task Behaviour with Lags on the Sum of Teacher Reprimands and Behaviour Talk

N=72	one interval lag on	real time	one interval	two interval	three interval	four interval
All Teacher Reprimands And Behaviour Talk	unwanted behaviour	recording	lag on	lag on	lag on	lag on
(207/270/271/203/230/231)			reprimands	reprimands	reprimands	reprimands
	-1	0	-1	-2	-3	-4
correlation reprimand and unwanted behaviour	-0.102	**0.248**	**0.622**	**0.372**	-0.048	-0.047
correlation reprimand and on task behaviour	0.005	0.005	-0.082	-0.018	0.233	**0.269**

When all teacher reprimand and behaviour talk is combined, the picture is quite different from that when teacher reprimand is directed to a target student alone (Table 5.3.8).

The correlation with unwanted behaviour in 'real time' (lag=0), is significant ($r=0.248$, $p<0.05$). A one interval lag on reprimand and behaviour talk (point -1) representing the subsequent nature of reprimand and behaviour talk, realises a correlation of $r=0.622$, $p<0.001$, a two interval lag a correlation of $r=0.372$, $p<0.01$ with student unwanted or competing behaviour. These three figures indicate considerable congruity between reprimand and behaviour talk with unwanted behaviour, all be it over a protracted time frame, three one minute intervals. The corresponding correlations with student on-task behaviour are insignificant. A negative insignificant correlation between teacher reprimands and behaviour talk and student unwanted behaviour is realised with a two-interval lag (point 5) after the data are juxtaposed to reflect the contiguity (point 3, lag = 3). At point -3 and -4 there exist small positive relationships ($r=0.233$, $p<0.1$, and $r=0.269$, $p<0.05$) between teacher reprimands and behaviour talk and student on-task behaviour.

Commentary The data indicate that whilst teacher reprimand and behaviour talk is highly related with student unwanted behaviour, and is protracted over time, the suppression effect on student unwanted behaviour is not significant. The relationship with student on-task behaviour only becomes related ($r=0.269$, $p<0.05$) after all teacher reprimand and behaviour talk is moved 4 intervals relative to student unwanted and on-task behaviour.

The data from teacher reprimands directed to the target student alone (270) show a moderate level of congruence (positive relationship) with student unwanted behaviour, and negative relationship with student on-task behaviour. The failure of teacher reprimands to reach a negative correlation with student unwanted behaviour indicates that teacher reprimands did not have a suppressive effect on student unwanted behaviour.

These results suggest a class wide focus to be more effective in reducing student unwanted behaviour than an individual focus although the suppression

effect is not statistically significant. A more positive relationship is realised between teacher reprimands and behaviour talk and student on-task behaviour at that equivalent point.

That all teacher reprimands and behaviour talk to all targets combined related more strongly with student on-task and unwanted behaviour than that targeted at an individual student is consistent with the view that teacher behaviour directed class-wide is of greater effect in classroom management and reflects the reality and practicalities of the situation.

Teacher Praise

Table 5.3.10 Correlation between the Mean Rates (Seconds per Minute) of Teacher Praise for Work, Praise for Behaviour (Severally and Combined) and One Interval Lag on the Mean Rates of Teacher Praise and Student On-Task Behaviour

Teacher Praise For Work And Behaviour:	Code:	Seconds	Incidents	Student on task	One interval lag	
Behaviour:		per Minute	per Minute	301/302/320	on teacher praise	Significance
teacher praise to whole class for work	205	0.135	1	-0.138		
teacher praise to target student for work	250	0.050	0.909	**-0.509**		P< 0.001
teacher praise to other students for work	251	0.633	1	0.064		
all teacher praise for work	205/250/251	0.817	1	-0.132		
teacher praise to whole class for behaviour	206	0.079	1	**0.403**		P< 0.001
teacher praise to target student for behaviour	260	0.014	0.545	-0.048		
teacher praise to other students for behaviour	261	0.218	1	0.138		
all teacher praise for behaviour	206/260/261	0.311	1	**0.314**		P< 0.01
all teacher praise for work and behaviour	205/250/251/206/260/261	1.128	1	0.061	-0.008	
all teacher praise to target student	250/260	0.064	0.909	**-0.485**	**-0.385**	p<0.01

All teacher praise (205/250/251/206/260/261) for work and behaviour correlated with student on-task behaviour (301/302/320), r=0.061. With a one interval lag on all teacher praise, r=-0.007, neither was significant (Table 5.3.10).

When further differentiated, teacher praise for work to the target student (250) was negatively related with student on-task behaviour r=-0.509, p<0.001 (a large relationship and effect size). Teacher praise for work and behaviour to the target student (250/260) related moderately, r=-0.485, p<0.001, with student on-task behaviour (301/302/320). A one interval lag on teacher praise for work and behaviour to the target student (250/260) was r=-0.385, p<0.01. A moderate positive relationship between teacher praise to the whole class for behaviour (206) and student on-task behaviour (301/302/320, r=0.403, p<0.001) was found.

Commentary The lack of significant correlation between all teacher praise (205/250/251/206/260/261) and student on-task behaviour (301/302/320), either contiguously (r=0.061) or with a one interval lag on all teacher praise (r=-0.007)

would not be expected from the literature. Nor would the large negative relationship found between teacher praise for work to the target student and student on-task behaviour r=-0.509, p<0.001 (Table 5.3.10).

The positive moderate relation between teacher praise for behaviour to the whole class (206) and student on-task behaviour (r=0.403, p<0.01) rather than being an anomaly may reflect the similarity in function between this and teacher behaviour talk and reprimands. That is, it may be a discriminative stimulus for potential negative consequences.

The large negative relationship (r=-0.509, p<0.001) between teacher praise for work to the target student (250) indicates that this has a deleterious effect on student on-task behaviour (301/302/320). This may be an artefact of praise being protracted as is inherent in proffering task specific praise. Arguably praise should be subject to the same experimentally deduced principles for punishment 'effectiveness' (Hester et al., 2009). The correlation between all teacher praise for work (205/250/251) and student on-task behaviour (r=-0.132) is not surprising as a negative correlation was expected here due to the distraction effect, although this is moderated by the notion that considerable of such praise to other students is private in nature, and the target student would not necessarily have been privy to the nature and quality of the interactions of the teacher with other students.

The moderate relationship between teacher praise to the whole class for behaviour (206) and student on-task behaviour (301/302/320), r=0.403, p<0.001, indicates it is perhaps a discriminative stimulus for potential teacher ire – that it is functioning as a negative reinforcer. This interpretation is partially supported by the correlation of the sum of teacher reprimands and behaviour talk to the whole class (207/203) relating with teacher praise for behaviour to the whole class (r=0.419, p<0.001). The moderate relation between teacher behaviour talk to the target student and teacher proximity to them (r=-0.349, p<0.01) indicates that this teacher behaviour was likely to be of a public nature (Table 5.3.4).

Viewing praise as a reinforcing event is not valid based on this data.

The Relationship between Teacher Task Talk and Teacher Reprimands

Table 5.3.11 Correlation between the Mean Rates (Seconds per Minute) of Teacher Task Talk and Teacher Reprimands

N=72							
Behaviour:	**Code:**	**Seconds/ minute**	**Incidents/minute**		**Correlation:**		
				207	270	271	207/270/271
teacher task talk to whole class	202	15.495	1	-0.032	-0.116	-0.167	-0.194
teacher task talk to target student	220	1.048	1	-0.013	0.209	0.161	0.179
teacher task talk to other students	221	11.090	1	-0.079	-0.127	0.083	-0.015
all teacher task talk	202/220/221	27.633	1	-0.137	-0.242	-0.094	-0.236
teacher reprimands whole class	207	0.315	1				
teacher reprimands target student	270	0.063	0.909				
teacher reprimands other student	271	0.661	1				
all teacher reprimands	207/270/271	1.039	1				

No significant correlations were obtained between teacher task talk severally or combined (202/220/221 and 202/220/221) and teacher reprimands (207/270/271 and 207/270/271).

Table 5.3.12 Correlations between the Mean Rates (Seconds per Minute) of Teacher Task Talk and Teacher Reprimands and Behaviour Talk For all Data Combined, N=72

N=72					**Correlation:**		
Behaviour:	**Code:**	**Seconds/ minute**	**Incidents/minute**				207/203/270/
				207/203	270/230	271/231	230/271/231
teacher task talk to whole class	202	15.495	1	0.042	**-0.336**	0.015	0.005
teacher task talk to target student	220	1.048	1	-0.237	**0.266**	-0.031	-0.191
teacher task talk to other students	221	11.090	1	**-0.374**	0.216	-0.191	**-0.382**
all teacher task talk	202/220/221	27.633	1	**-0.434**	-0.150	-0.202	**-0.480**
teacher reprimand and behaviour talk to whole class	207/203	0.926	1				
teacher reprimand and behaviour talk to target student	270/230	0.136	1				
teacher reprimand and behaviour talk to other student	271/231	1.398	1				
sum of teacher reprimands and behaviour talk	207/203/270/230/271/231	2.460	1				

Moderate relationships (and effect sizes) were found between teacher task talk to the whole class (202) and teacher reprimands and behaviour talk to the target student (270/230), $r=-0.336$, $p<0.01$; between teacher task talk to other students (221) and teacher reprimands and behaviour talk to the whole class (207/203), $r=0.374$, $p<0.01$; between teacher task talk to other students (221) and all teacher reprimands and behaviour talk, $r=-0.382$, $p<0.01$; between all teacher task talk (202/220/221) and all teacher reprimands and behaviour talk (207/203), $r=-0.434$, $p<0.001$, and between all teacher task talk (202/220/221) and all teacher reprimands and behaviour talk (207/203/270/230/271/231), $r=-0.480$, $p< 0.001$.

Commentary Overall, correlations are of negative valence which is what would be expected. That is, as teacher task talk increased reprimands and behaviour talk decreased. All teacher task talk limiting teacher reprimand and behaviour talk.

Teacher task talk to the target student (220) related positively (r=0.266, p<0.05) with teacher reprimand and behaviour talk to the target student (270/230). This small to moderate relationship is surprising although is consistent with the negative relationships found between other individually directed behaviour.

Table 5.3.13 The Mean Rates (Incidents and Seconds per Minute) of Teacher Social Talk to the Target Student, to the whole Class, to the Target Student and Other Students Combined and Correlations between Mean Rates (Seconds per Minute) of On-Task and Unwanted Behaviour

Teacher Social Talk			**Correlation**			
	seconds per minute	incidents per minute	student on-task	student unwanted	teacher reprimand	
			behaviour	behaviour	and behaviour talk	
to the target student	0.025	0.455	-0.149	0.054	-0.086	
to whole class, target student						
and other students	1.046	1.000	0.255	-0.047	**0.409**	P< 0.01
					0.436	P< 0.001
					with threats	

Teacher social talk to the target student occurred very little (Table 5.3.13), although for all targets combined occurred in every interval at a rate of 1 second per minute. Obtained correlations between social talk and both student on-task and unwanted behaviour were not significant. The results indicated moderate relationships between all teacher reprimand and behaviour talk and all teacher social talk, more so if teacher threats were included.

Commentary Whilst results show teacher social talk to be minimally related to student on-task and unwanted behaviour, the relationship found with teacher reprimand and behaviour talk indicates that some effort is required to re-establish a work focus.

Summary and Discussion

Teacher task talk to the whole class (202) and all teacher task talk combined (202/220/221) related with both student on-task behaviour (r=0.704, p<0.001, r=0.454, p<0.001) and student unwanted or competing behaviour (r=-0.572,

p<0.001, r=-0.499, p<0.001), with moderate to large effect sizes (Table 5.3.14**).** Teacher task talk targeted at the individual student (220) related negatively with student on-task behaviour, a moderate effect size (r=-0.364, p< 0.01), and positively with student unwanted behaviour (r=0.156).

Table 5.3.14 Correlations between Differentiations of the Mean Rates (Seconds per Minute)of Teacher Task Talk and Student On-Task Behaviour and Unwanted Behaviour and respective Alpha Levels

Correlation coefficients, and alpha levels, for differentiations of	**all data N=72**		
teacher task talk and student on-task behaviour		**r**	**alpha**
teacher task talk to whole class and student on-task behaviour	202 with 301/302/320	0.704	0.001
teacher task talk to all targets combined and student			
on-task behaviour	202/220/221 with 301/302/320	0.454	0.001
student working and attending to teacher and teacher task			
talk to the whole class	202 with 301	0.719	0.001
teacher task talk to whole class and student unwanted behaviour	202 with unwanted	-0.572	0.001
all teacher task talk and student unwanted behaviour	202/220/221 with unwanted	-0.499	0.001

Large to very large relationships and effect sizes were found between teacher task talk to the whole class (202) and student on-task behaviour (301) and student unwanted behaviour (r=0.719, p<0.001 and r=-0.572, p<0.001 respectively). These results represent that data that most represents the public aspect of teacher task talk that is accessible to the target student.

Hypothesis H_1 and Hypothesis H_2 can be considered to be supported by the results in Table 5.3.14.

Hypothesis H_1 A high rate of teacher task talk would be associated with a high rate of student on-task behaviour**.** High rates of teacher task talk are both discriminative stimuli for students gaining and maintaining task orientation, and are prescriptive or defining of the contingency operating for student attention and behaviour. *This would be evident in a significant positive correlation between the independent variables, the rate of teacher task talk to the whole class (202) and combined (202/220/221) and the dependent variable, student on-task behaviour (301/302/320).*

Hypothesis H_2 A high rate of teacher task talk would be associated with reduced rates of student unwanted or competing behaviour. Competing or

unwanted behaviour, such as talking with peers, would be expected to be more manifest in the 'void' created by less teacher task talk. *This would be evident in a significant negative correlation between the independent variable, teacher task talk to the whole class (202) and combined (202/220/221), and the dependent variable, student unwanted or competing behaviour.*

Hypothesis $H_{2,}$ that there is a significant negative relationship between the rate of teacher task talk and student unwanted or competing behaviour in classroom settings are supported by the data in this section.

Moderate to large negative relationships were found between teacher praise to the target student for work (250) and student on-task behaviour ($r=-0.509$, $p<0.001$), and for teacher praise for work and behaviour combined (250/260) to the target student ($r=-0.485$, $p<0.001$).

The lack of positive relationships between all teacher praise (205/250/251/206/260/261) and student on-task behaviour (301/302/320), either contiguously ($r=0.061$) or with a one interval lag on all teacher praise ($r=-0.007$) would not be expected from the literature describing praise as a reinforcing event (Gable, Hester, Rock & Hughes, 2009). Nor would the large negative relationship between teacher praise for work to the target student and student on-task behaviour, $r=-0.509$, $p<0.001$ (Table 5.3.10). These results are consistent with those in Sections 5.1 and 5.2 of the current study and with Owen, Slep and Heyman, (2012) who described no reliable link having been established in the literature between praise and compliance.

The data indicate that whilst teacher reprimands and behaviour talk combined (to all targets) are highly related with student unwanted behaviour, and are protracted over time (two intervals), the suppression effect on student unwanted behaviour is not substantial. A negative relationship was found between all teacher reprimands and behaviour talk and student unwanted behaviour with a two interval lag after the data are juxtaposed (cross correlated) to reflect the maximal relationship between the two variables. At this point a small positive relationship ($r=0.269$, $p<0.05$) between teacher reprimands and behaviour talk and student on-task behaviour was found (Table 5.3.9).

The data from teacher reprimands directed to the target student (270) alone realised a moderate level of congruence (positive relationship) with student unwanted behaviour, and negative relationship with student on-task behaviour (one interval lag). The failure of teacher reprimands to the target student to reach a negative relationship with student unwanted behaviour indicates that teacher reprimands did not have a suppressive effect on student unwanted behaviour (Table 5.3.8).

The above results indicate a class wide focus to be more effective in reducing student unwanted behaviour than an individual focus although neither the suppression effect is large nor is the subsequent increase in student on-task behaviour. The lesser relationships found between teacher reprimand relative to reprimand plus behaviour indicates that behaviour talk, or talk about conduct, is often sequalae to, or is used as an alternative to reprimand.

The lack of significant correlations between teacher proximity to the target student and most teacher–student directed behaviour indicate that teacher proximity is generally not used specifically as a management strategy. This is surprising given the rate of teacher proximity to the target student (8.077 seconds per minute) although consistent with previous analyses (Sections 5.1 and 5.2).

No relationships were found between teacher social talk and student on-task and unwanted behaviour whether this was directed to the target student or all targets combined. Moderate relationships were found between all teacher reprimand and behaviour talk and all teacher social talk. The association with reprimand and behaviour talk, indicate that teacher social talk cannot be seen as relationship enhancing, some effort is subsequently required to re-establish a work focus.

The results relating to teacher reprimands, reprimands plus behaviour talk, and teacher praise were not definitive in respect to the hypotheses. Indications are that a high rate of teacher task talk to the whole class, the target student and other students are salient in both maintaining student on-task behaviour and maintaining unwanted behaviour at low levels. The lack of significant positive relation between teacher praise for work and student on-task behaviour strongly indicates Hypothesis H4 is not supported. A high rate of teacher task talk would be associated with a

high rate of student on-task behaviour and with praise being significantly related to both variables. *This would be evident in a significant positive correlation between teacher praise and student on-task behaviour given a high rate of teacher task talk. That is a conditional functional relationship.*

The above results show that teacher task talk directed to the whole class and all targets combined relates positively with student on-task behaviour and negatively with student unwanted behaviour. Teacher task talk directed to an individual target student relates negatively with student on-task behaviour and positively with student unwanted behaviour. This indicates a commonness of student behaviour and deleterious effect for individually directed behaviour within the classroom setting. These results are consistent with the relative ratios of teacher verbal behaviour directed to the target student and to all targets combined, to student on-task and unwanted behaviour. They indicate student on-task behaviour to be more than a function of the contingencies operating for the individual student (Galizio, 1979, Hayes, Brownstein and Kern, 1986, Hackenberg and Joher, 1994 and Schmitt, 1998), that consideration of the wider social (classroom) context, in this case rates of teacher task talk, and the referent behaviour, are necessary elements in descriptive analysis (Carr, 1994). This is more than seeing most student behaviour within the classroom to be rule-governed or instructed behaviour (Fantino, 2004).

5.4 Teachers Describing Management Difficulties (N=17) and those not Describing Such Difficulty (N=53)

Introduction

The data was further differentiated on the basis of those teachers who saw themselves having difficulty with classroom management (N=17) and hence teaching, and the remainder (N=53).

This differentiation was made by the teachers themselves stating (without solicitation) that they were having difficulty in both the management and teaching of their classes.

In his summary of the literature, Church (2003) stated, “The instructional systems that have been found to be most effective, not only in maintaining student interest but also in fostering the learning of at-risk students, all involve fairly fast-paced classroom activities,” ... this, plus increasing the “level of active responding results in a marked reduction in the disruptive behaviour rate of both low decile students and students with behaviour difficulties.” (p.111). Similar and related findings have been presented by Ayllon, & Roberts (1974); Ogden Lindsley (1992); Sutherland and Wehby (2000); Frey, Hirschstein, & Guzzo (2000) and Sutherland, Alder and Gunter (2003). These results are also consistent with those of Lane (1999, 2001) showing that increasing student engagement reduces disruptive behaviour.

Previous analysis of classroom behaviour (all data combined, N=72, Section 5.3) has shown a strong positive relationship between teacher task talk to the whole class and student on-task behaviour ($r=0.703$, $p<0.001$) and correspondingly with student unwanted or competing behaviour ($r=-0.572$, $p<0.001$). Teacher task talk combined (to the class, to the target student and to other students) related positively with student on-task behaviour and negatively with unwanted or competing behaviour ($r=0.454$, $p<0.001$ and $r=-0.499$, $p<0.001$ respectively).

It was expected from the literature that ‘effective management’ would involve greater application of known behavioural principles in respect to attention for work and praise for student on-task or wanted behaviour, and reprimand, ‘planned ignoring’ (selective attention) for student unwanted behaviour and greater opportunity for students to respond (Sherrill et al., 1996; Lerman and Vorndran, 2002; Sutherland et al., 2008).

In the current study, a high rate of teacher task talk (the independent variable) is seen as salient in maintaining an effective learning environment, and a whole class orientation more effective at maintaining high rates of student on-task behaviour and low rates of student unwanted behaviour than an approach in which the focus is on individual behaviour- subsequent event relations (Sections 5.1, 5.2,

and 5.3). It was expected that these strategies, rather than the research-based strategies, would be proactively pursued and that there would be obvious indication of contiguous and contingent association between teacher whole class directed verbal behaviour and student behaviour, for the group of teachers not describing management difficulties.

This analysis enabled the exploration of differences between teaching practices in the different samples.

Method

Subjects The data for this analysis was differentiated on the basis of those teachers who saw themselves having difficulty with class management (N=17 sessions) and hence teaching, and the remainder (N=53 sessions). 7 teachers saw themselves as having management difficulties.

This differentiation was made by the teachers themselves stating (without solicitation) that they were having difficulty in both the management and teaching of their classes.

Participants were teachers and students within 'mainstream' schools across different year levels (years 2–13). Classes recorded in Primary and Intermediate Schools were mainly general in nature (reading writing arithmetic and or topic based (one art class)). Subjects recorded in the Secondary School included mathematics, English and religious studies.

26 teachers participated in the study. Years teaching experience ranged from 4 to 43 years, the mean was 16.9 years, median 15 years. 62 students participated, six were Primary School students, 32 were Intermediate School and 24 Secondary School.

The research was focused on observing and describing teacher practice during the course of normal classroom interactions and tasks and student responses to these.

There was no necessity to personally identify either teachers, students or classes. School identities were retained simply for ease of recognition.

Participation was voluntary.

Setting The settings were general education classrooms in Primary and Intermediate Schools in the Hastings and Napier areas in State Schools and in a State Integrated Secondary School.

Three Primary Schools participated (deciles 2, 3 and 1) year levels 1 to 6; ages 5 years to 11 years two of which included year levels 7 and 8; two Intermediate Schools (decile 2 and 8; year levels 7 and 8; ages 11 years to 12 years) and one Secondary School (decile 4; levels 9 to 13; ages 13 to 18). The schools selected include a range of students from varying socio-economic backgrounds.

The Secondary School was a State Integrated (i.e. state funded) religion-based single sex (male) school.

Procedure The procedure followed involved videoing classrooms during normal teacher classroom instruction (Section 2.3).

Data Collection Behaviour observation codes are described in Section 2.7, inter-observer agreement in Section 2.9 and Section 4.1 of the Results Section. Agreement was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100%. Mean occurrence agreement for the dependent and independent variables was 97.65%, and median 98.99%.

Data Analysis Rates (incidents per minute) and duration (seconds per minute) of praise and reprimand were calculated across year levels and combined. Teacher task talk was assessed as an overriding functional variable (independent variable) relative to other teacher behaviour.

The on-task and unwanted behaviour of the target child is taken as a proxy measure of class performance (the dependent variable). The direction of teacher and student behaviour are measured, for example, teacher task talk to the target

student, to other students and to the whole class. The direction of student behaviour is toward the teacher or other students.

Data was truncated (made of equal interval length) to enable correlation tables to be completed and independent variables correlated with dependent variables (Section 2.10). Primary correlation tables were constructed using seconds per minute data alone which was summed within 60 second intervals. This measure included all data from within-session real-time recordings and represents all data recorded on a continuous basis. This enables a more accurate analysis of the temporal relationships between the independent and dependent variables (Rapp et al., 2001), than would be found in temporally discontinuous or interval recording ('incidence per minute' in this study). Teacher behaviour was correlated with on-task behaviour and unwanted or competing behaviour (all correlations are two-tailed tests). Cross correlations were calculated in order to assess the behaviour-subsequent event nature of the respective independent and dependent variables. Contiguous correlations do not show the temporal relations e.g. teacher praise succeeding student on-task behaviour and reprimand succeeding student unwanted behaviour. The optimal correlation between these variables indicates the time taken for the effect to impact on the value of the other or the protracted nature or otherwise of the independent variable. Percentages of teacher praise and reprimand were calculated relative to student on-task and unwanted behaviour respectively to deduce the occurrence of these compared with the referent or background student behaviour.

Results were recorded graphically to further illustrate these relations. Comparative data was analysed alongside relevant correlation tables (matrices). Teacher verbal behaviour was correlated with on-task behaviour and unwanted or competing behaviour (all correlations are two-tailed tests).

For the current analysis, the data relating to teacher praise, reprimands, behaviour talk, task talk, social talk, teacher proximity and student on-task behaviour and unwanted behaviour were differentiated in accord with teacher's who had expressed management difficulty (N=17) and those that had not (N=53), summed across recorded classes and means calculated. All Figures and Tables

represent the mean values for those particular analyses (N=17 and N=53). Correlation matrices were constructed from this data.

Results

Differences Between Samples

Table 5.4.1 The Mean Rates of all Teacher Praise, Reprimands and Behaviour Talk, Task Talk, Student On-Task Behaviour and Student Unwanted or Competing Behaviour (Seconds per Minute) for Teachers Describing Management Difficulties (N=17) and Those Not Describing Such Difficulty (N=53)

Behaviour (Seconds Per Minute):	**Behaviour Code:**	**N=17**	**N=53**
		seconds per minute	seconds per minute
student on task behaviour	301/302/320	36.241	49.030
all teacher task talk	202/220/221	22.283	30.392
sum teacher reprimand and behaviour talk	207/203/270/230/271/231	4.996	1.739
all teacher praise	205/50/51/206/60/61	1.088	1.194
student unwanted or competing behaviour	330/305/6/7/8/340/350/360	6.975	2.363

The above data (Table 5.4.1) is consistent with the trend noted in previous Sections and the alternative hypotheses for this research (H_1, H_2 and H_3), that a high rate of teacher task talk that was public in nature would maintain high rates of student attention and application to task (301/302/320) and lesser rates of student unwanted behaviour**.** Conversely, that a lower rate of teacher task talk would be associated with lesser rates of student on-task behaviour, greater rates of student social talk (330) and other unwanted or competing behaviour (305,6/7/8/330/40/50/60), and greater rates of reprimand and behaviour talk (203/7/230/70/231/71). That a high rate of teacher task talk would be evident in fewer reprimands and in reprimands and behaviour talk.

All teacher praise is of slightly greater rate (seconds per minute) for sample N=53. All recorded behaviour is in the direction expected from such a differentiation of classes. The behaviour in the above table occurred in every interval, thus incidents per minute equals 1.

The differences between the two samples can be seen more clearly in the following Figures.

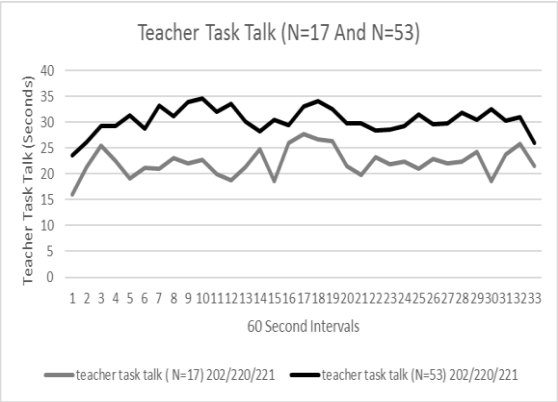


Figure 5.4.1 Mean Rates (Seconds per Minute) of Teacher Task Talk for Teachers Expressing Management Difficulty (N=17) and Those Not (N=53)

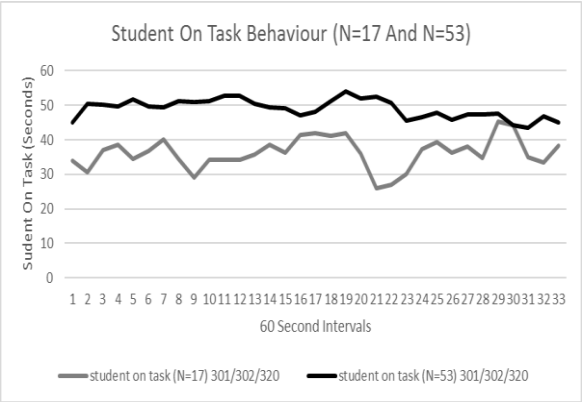


Figure 5.4.2 Mean Rates (Seconds per Minute) of Student On-Task Behaviour for Teachers Expressing Management Difficulty (N=17) and Those Not (N=53)

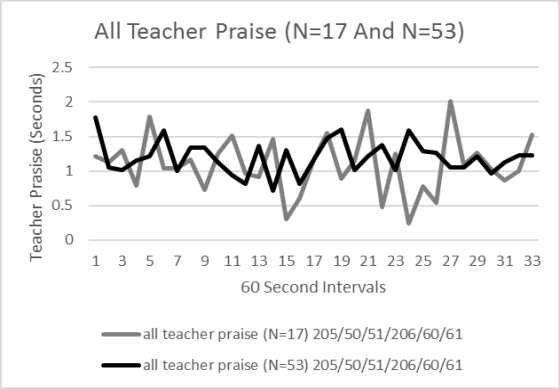


Figure 5.4.3 Mean Rates (Seconds per Minute) of All Teacher Praise for Teachers Expressing Management Difficulty (N=17) and Those Not (N=53)

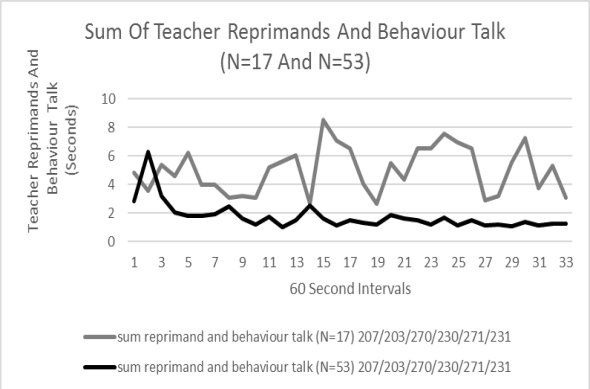


Figure 5.4.4 Mean Rates(Seconds per Minute) of Teacher Reprimands and Behaviour Talk for Those Teachers Expressing Management Difficulty (N=17) and Those Not (N=53)

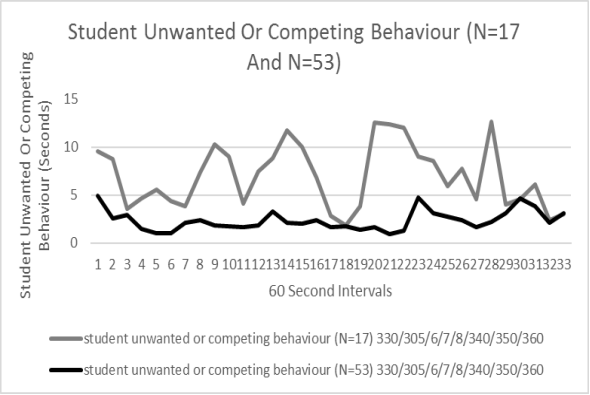


Figure 5.4.5 Mean Rates (Seconds per Minute) of Student Unwanted Behaviour for Teachers Expressing Management Difficulty (N=-17) and Those Not (N=53)

In Figures 5.4.1 to 5.4.5 teacher task talk (202/220/221) combined and student on-task behaviour (301/302/320) are visibly greater for sample N=53 than sample N=17. N=17 data shows greater variability across praise, reprimand and behaviour talk and student unwanted or competing behaviour than sample N=53.

The greater variability of teacher praise (205/250/251/206/260/261) for sample N=17 compared to N=53 indicates that teacher praise was more protracted in nature in sample N=17 when it did occur than in sample N=53 – the rate (seconds per minute) for N=53 was slightly higher (1.19 seconds per minute) than for N=17 (1.08 seconds per minute), albeit the rates are essentially equivalent for both samples.

This variability is more manifest in respect to teacher reprimands and behaviour talk (207/203/270/230/271/231) and student unwanted or competing behaviour (330/304/305/306/307/308/340/350/360/370). Both samples show elevated and extended rates of teacher reprimands and behaviour talk at the outset of class.

Teacher Task Talk

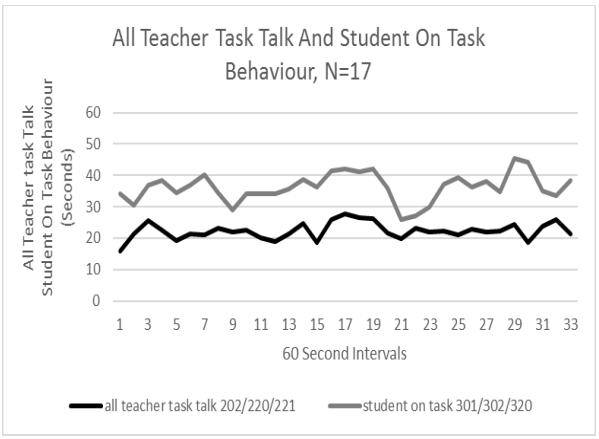
Table 5.4.2 Mean Rates (Seconds and incidents per Minute) of Teacher Task Talk Differentiated and Combined, and Means of Student On-Task Behaviour), and Correlations (Seconds per Minute) with Mean Rates of Student On-Task Behaviour for Samples N=53 And N=17.

Teacher Task Talk:		**seconds/minute**	**incidents/minute**	**Correlation With Student On Task Behaviour:**			
N=17				**301**	**302**	**320**	**301/302/320**
teacher task talk to whole class	202	13.307	1	0.314	-0.310	-0.336	0.184
teacher task talk to target student	220	1.216	0.970	-0.060	0.330	0.215	0.047
teacher task talk to other	221	7.761	1	-0.118	0.225	0.401	0.021
sum of teacher task talk	202/220/221	22.283	1	0.313	-0.077	0.070	0.328
N=53				**301**	**302**	**320**	**301/302/320**
teacher task talk to whole class	202	16.781	1	**0.599**	-0.218	-0.111	**0.600**
teacher task talk to target student	220	1.034	1	**-0.436**	**0.580**	**0.309**	**-0.332**
teacher task talk to other	221	12.577	1	**-0.403**	0.003	**0.435**	**-0.341**
sum of teacher task talk	202/220/221	30.392	1	0.285	-0.124	**0.395**	**0.382**

No significant correlations were found between teacher task talk severally or combined and student on-task behaviour for those teachers who had expressed difficulty (N=17). Large positive relationships were found between teacher task talk to the whole class (202, r=0.600, p<0.001)) and student on-task behaviour

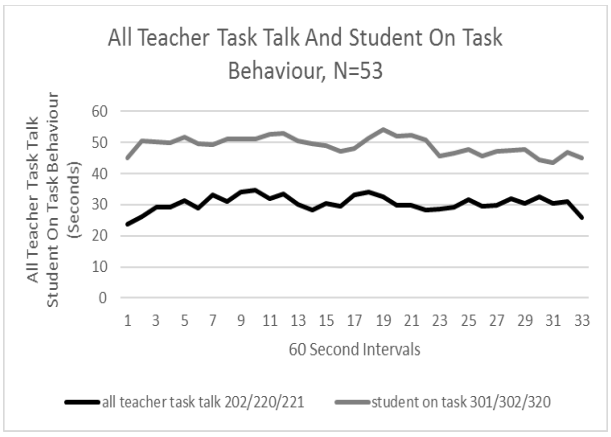
(301/302/320) indicating a stronger relationship between these two variables than for the sum of teacher task talk (202/220/221) with student on-task behaviour (301/302/320, r=0.382, p< 0.01) for N=53. Medium or moderate relationships were found between teacher task talk to the target student (220, r=-0.332, p<0.02) and to other students (221, r=-0.341, p<0.02) and student on-task behaviour (301/302/320).

Figures 5.4.6 and 5.4.7 show the graphical representation of the difference between the samples in respect to all teacher task talk combined and student on-task behaviour.



r= 0.328

Figure 5.4.6 Mean Rates (Seconds per Minute) of All Teacher Task Talk (202/220/221) and Student On-Task Behaviour (301/302/320) for Sample N=17



r= 0.382, p< 0.01

Figure 5.4.7 Mean Rates (Seconds per Minute) of All Teacher Task Talk (202/220/221) and Student On-Task Behaviour (301/302/320) for Sample N=53

There is greater variability in both teacher task talk and student on-task behaviour in sample N=17 relative to N=53.

The rates of teacher task talk between samples N=17 and N=53 (seconds per minute) are substantially different (Table 5.4.3). The percentage of teacher task talk to the target student and other students relative to all teacher task talk is 4.500 seconds per minute more in N=53 than N=17. The difference for teacher task talk to the whole class is also 4.500 seconds per minute. The differentials are surprising in that teacher task talk to the whole class relates considerably more to student on-task behaviour than does any measure of teacher talk to the target student or other

students. The absolute rates are greater for N=53 across all measures of teacher task talk.

Table 5.4.3 Mean Differences (Seconds per Minute) between Teacher Task Talk Severally and Combined for Samples N=17 and N=53 and Mean Rates (Seconds per Minute) of Teacher Task Talk to the Whole Class and to the Target Student and Other Students Combined as a Percentage the Means of all Teacher Task Talk

Teacher Task Talk (Seconds Per Minute):		N=17	N=53	Difference:
teacher task talk to whole class	202	13.307	16.781	3.474
teacher task talk to target and other students	220/221	8.977	13.611	4.634
sum of teacher task talk	202/220/221	22.283	30.392	8.109
teacher task talk to whole class, % of all teacher task talk		59.715	55.215	-4.500
teacher task talk to target and other students, % of all teacher task talk		40.285	44.785	4.500

Commentary Large relationships were found between teacher task talk to the whole class (202, r= 0.600, p<0.001)) and student on-task behaviour (301 and 301/302/320) indicating a stronger relationship between these two variables than for the sum of teacher task talk with student on-task behaviour (301/302/320, r=0.382, p<0.01) for N=53. The moderate negative relations between teacher task talk to the target student (220, r=-0.332, p<0.02) and to other students (221, r=-0.341, p<0.02) and student on-task behaviour (301/302/320) indicate that this direction of teacher task talk does not add incrementally to overall student on-task behaviour. This probably reflects a distraction effect for both.

The results indicate that teacher task talk combined (202/220/221), and particularly teacher task talk to the whole class (202), are functionally related to maintaining student on-task behaviour, this more so than is evidenced by an individual focus (220). In this example, with teacher task talk being greater than 50% of available time (N=53) and less than 38% N=17).

Hypothesis H_1, postulating that a high rate of teacher task talk would be associated with a high rate of student on-task behaviour in classroom settings can be considered to be supported by these results.

Hypothesis H_1 A high rate of teacher task talk would be associated with a high rate of student on-task behaviour**.** High rates of teacher task talk are both discriminative stimuli for students gaining and maintaining task orientation, and are prescriptive or defining of the contingency operating for student attention and behaviour. *This would be evident in a significant positive correlation between*

the independent variables, the rate of teacher task talk to the whole class (202) and combined (202/220/221) and the dependent variable, student on-task behaviour (301/302/320).

Teacher Task Talk and Student Unwanted Behaviour

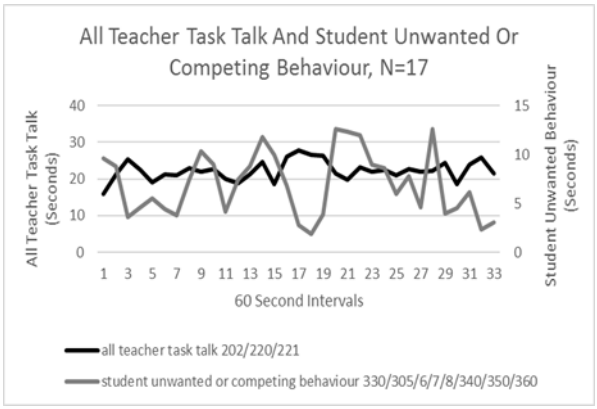
Table 5.4.4 Mean Rates (Incidents and Seconds per Minute) of Teacher Task Talk Differentiated and Combined and Student Unwanted Behaviour and Correlations with Mean Rates (Seconds per Minute) of Student Unwanted Behaviour for Samples N=17 and N=53

N=17				**Correlation**
Behaviour:	**Code:**	**time/min**	**incidents/min**	**unwanted behaviour**
teacher task talk to whole class	202	13.307	1	-0.195
teacher task talk to target student	220	1.216	0.970	-0.004
teacher task talk to other students	221	7.761	1	-0.030
all teacher task talk	202/220/221	22.283	1	-0.343
student unwanted or competing behaviour	330/305/6/7/8/340/350/360	6.975	1	1.000
N=53				**Correlation**
Behaviour:	**Code:**	**time/min**	**incidents/min**	**unwanted behaviour**
teacher task talk to whole class	202	16.781	1	**-0.545**
teacher task talk to target student	220	1.034	1	0.142
teacher task talk to other students	221	12.577	1	**0.330**
all teacher task talk	202/220/221	30.392	1	**-0.374**
student unwanted or competing behaviour	330/305/6/7/8/340/350/360	2.363	1	**1.000**

For sample N=53, large relationships were found between teacher task talk to the whole class (202, r=-0.545, p<0.001) and all teacher task talk (202/220/221, r=-0.374, p<0.01) with student unwanted behaviour. These results indicate that a high rate of teacher task talk (greater than 50% of available time in this case) does significantly relate to both student on-task behaviour (Table 5.4.2) and student unwanted or competing behaviour (Table 5.4.4). Conversely, that a rate of teacher task talk constituting 37% of available time (N=17) is associated with a loss of those relationships. An elevated albeit insignificant relationship (r=-0.343) was found (Table 5.4.4) between all (the sum of) teacher task talk (202/220/221) and student unwanted or competing behaviour for those teachers who expressed difficulty (N=17).

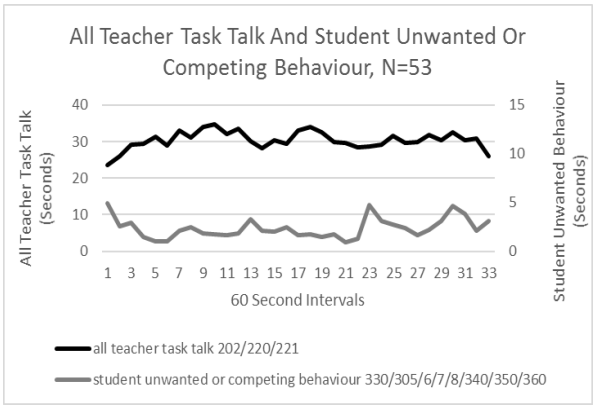
A moderate positive relationship between teacher task talk to other students and student unwanted or competing behaviour was found for sample for N=53 (r= 0.330, p< 0.05).

No significant correlations were found in sample N=17 between teacher task talk (202/220/221) and unwanted or competing behaviour (330/305/306/307/308/340/350/360, Table 5.4.4 and Figure 5.4.8). Student unwanted or competing behaviour is considerably more variable and of greater rate and is more protracted across intervals than N=53 (Figures 5.4.8 and 5.4.9).



r= -0.343

Figure 5.4.8 Mean Rates (Seconds per Minute) for All Teacher Task Talk (202/220/221) and Student Unwanted Behaviour (330/305/6/7/8/340/350/360) for N=17



r= -0.374, p< 0.01

Figure 5.4.9 Mean Rates (Seconds per Minute) for All Teacher Task Talk (202/220/221) and Student Unwanted Behaviour (330/305/6/7/8/340/350/360) for N=53

Commentary Student unwanted behaviour for N=17 is characterised by greater variability, greater rate and is more protracted across intervals than N=53 Figures 5.4.8 and 5.4.9).

For sample N=53, significant negative correlations were found between teacher task talk to the whole class (202, r=-0.5445, p<0.001) and all teacher task talk (202/220/221, r=-0.374, p< 0.01) with student unwanted behaviour.

The lack of significant relationships in sample 17 between all teacher task talk and student unwanted behaviour (although it was elevated, r=-0.343 it was not significant) indicates that such a relationship does not exist to the same extent when teacher task talk falls below a certain rate**.** Teacher task talk in sample N=53 is 50.65% of the time, for N=17 it is 37.13% of the available time.

The medium or moderate positive relationship between teacher task talk to other students and student unwanted or competing behaviour that was found for sample for N=53 (r=0.330, p<0.05) may indicate a distraction effect or be an artefact of the teacher being 'otherwise engaged' and providing opportunity. This

result corresponds with the similar negative relationship obtained between teacher task talk to other students and target student on-task behaviour ($r=-0.341$, $p<0.02$, Table 5.4.2). The relationships between teacher task talk to the target student and student on-task behaviour ($r=-0.332$, $p<0.02$) and teacher task talk to the target student and student unwanted or competing behaviour ($r=0.142$). Combined, these results indicate more substantive relationships between teacher task talk to the whole class and at a certain rate, than are apparent for an individual student focus.

Hypothesis H_2, postulating that a high rate of teacher task talk would be associated with reduced rates of student unwanted or competing behaviour in classroom settings, is supported by these results.

Hypothesis H_2 high rate of teacher task talk would be associated with reduced rates of student unwanted or competing behaviour. Competing or unwanted behaviour, such as talking with peers, would be expected to be more manifest in the 'void' created by less teacher task talk. *This would be evident in a significant negative correlation between the independent variable, teacher task talk to the whole class (202) and combined (202/220/221), and the dependent variable, student unwanted or competing behaviour.*

The correlation table below (Table 5.4.5) suggests that completely different contingencies are in operation between the two samples, the only notable relationship between teacher talk and student on-task behaviour (301) in the sample with reported difficulty (N=17) is with teacher behaviour talk to the whole class (203, $r=0.431$, $p<0.05$) which may reflect a greater imminence of consequences at these times.

Table 5.4.5 Correlations (Seconds per Minute) and Mean Rates (Incidents and Seconds per Minute) of Teacher Task Talk, Behaviour Talk and Student Social Talk with Student On-Task Behaviour (Severally and Combined) for those Teachers Expressing Management Difficulty (N=17) and Those Not Expressing Difficulty (N=53)

Teacher Task Talk, Behaviour Talk, And Social							
Talk To The Target Student With Student							
On Task Behaviour:		**time/min**	**incidents/min**	**Correlation:**			
N=17				**301**	**302**	**320**	**301/302/320**
teacher task talk to whole class	202	13.307	1.000	0.314	-0.310	-0.336	0.184
teacher task talk to target student	220	1.216	0.970	-0.060	0.330	0.215	0.047
teacher task talk to other	221	7.761	1.000	-0.118	0.225	0.401	0.021
sum of teacher task talk	202/220/221	22.283	1.000	0.313	-0.077	0.070	0.328
teacher behaviour talk to whole class	203	0.900	0.909	**0.431**	-0.030	-0.178	0.390
teacher behaviour talk to target student	230	0.217	0.758	0.205	0.063	-0.147	0.180
teacher behaviour talk to other	231	1.221	1.000	-0.094	0.026	-0.133	-0.128
sum of teacher behaviour talk	203/230/231	2.339	1.000	0.210	0.014	-0.220	0.159
student social talk to teacher	303	0.121	0.576	0.343	0.129	-0.169	0.327
student social talk to other student	330	6.023	1.000	**-0.546**	0.112	-0.131	**-0.578**
sum of student social talk	303/330	6.144	1.000	**-0.521**	0.122	-0.144	**-0.554**
N=53				**301**	**302**	**320**	**301/302/320**
teacher task talk to whole class	202	16.781	1.000	**0.599**	-0.218	-0.111	**0.600**
teacher task talk to target student	220	1.034	1.000	**-0.436**	**0.580**	**0.309**	**-0.332**
teacher task talk to other	221	12.577	1.000	**-0.403**	0.003	**0.435**	**-0.341**
sum of teacher task talk	202/220/221	30.392	1.000	0.285	-0.124	**0.395**	**0.382**
teacher behaviour talk to whole class	203	0.541	0.970	0.168	-0.133	**-0.356**	0.087
teacher behaviour talk to target student	230	0.030	0.606	-0.270	**0.508**	-0.270	-0.290
teacher behaviour talk to other	231	0.609	1.000	**0.509**	-0.339	**-0.451**	**0.411**
sum of teacher behaviour talk	203/230/231	1.181	1.000	0.265	0.294	-0.200	**-0.466**
student social talk to teacher	303	0.025	0.364	-0.084	0.131	0.154	-0.041
student social talk to other student	330	2.106	1.000	**-0.589**	0.173	-0.228	**-0.671**
sum of student social talk	303/330	2.132	1.000	**-0.596**	0.181	-0.219	**-0.675**

student on task	301
student task talks to teacher	302
student task talks to other	320
sum of student on task behaviour	301/302/320

For N=17, teacher behaviour talk to the whole class (203) related moderately ($r=0.431$, $p<0.05$) with student on-task behaviour (301).

For N=53, teacher behaviour talk to other students (231) and all (the sum of) teacher behaviour talk (203/203/231) correlated ($r=0.509$, $p<0.001$) with student on-task behaviour (301), a large relationship and effect size, and ($r=0.411$, $p<0.01$) with all student on-task behaviour (301/302/320), a medium to large relationship. Teacher task talk to the target student and teacher task talk to other students, indicated a moderate to large relationship, albeit negatively with student on-task behaviour (301), $r=-0.436$, $p<0.01$ and $r=0.403$, $p<0.01$ respectively. A large positive relationship was found between teacher behaviour talk to the target student

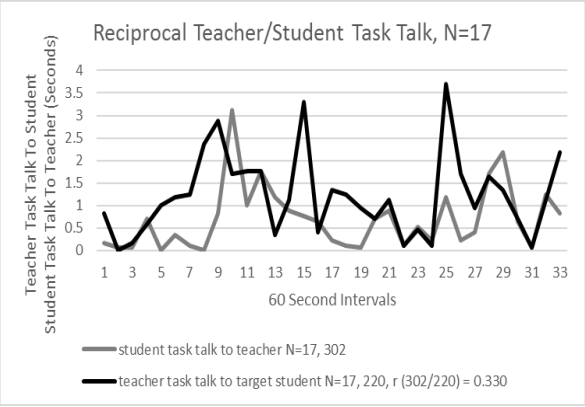
(230) correlates positively with target student task talk to the teacher (r= 0.508, p<0.001).

Reciprocal Teacher–Student Task Talk ('Opportunities to Respond')

Table 5.4.6 Mean Rates (Incidents and Seconds per Minute) of Reciprocal Teacher-Student Task Talk ('Opportunities to Respond') for Samples N=17 and N=53

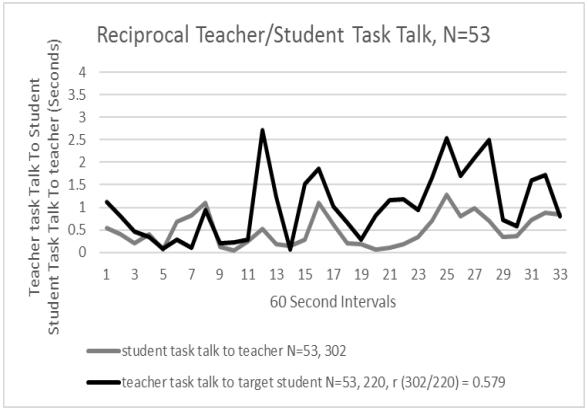
Reciprocal Teacher-Student Task Talk.					
Behaviour:	**Code:**		**Samples:**		
		N=17		**N=53**	
		seconds/minute	**incidents/minute**	**seconds/minute**	**incidents/minute**
teacher task talk to student	220	1.215	0.969	1.034	1
student task talk to teacher	302	0.696	0.939	0.489	1
teacher task talk to other student	221	7.761	1.000	12.577	1.000
student task talk to other student	320	0.713	0.576	1.647	1.000
all teacher task talk	202/220/221	22.28342246	1	30.39222413	1

The rates (seconds per minute) and dispersion (incidents per minute) of teacher–student task talk are quite similar (220 and 302). The ratio of teacher task talk to the target student relative to target student task talk to the teacher is 1.746 to 1 for N=17, for N=53 it is 2.114 to 1. Topographically the two data sets are quite different.



r= 0.330

Figure 5.4.10 Mean Rates (Seconds per Minute) of Reciprocal Teacher-Student Task Talk for Sample N=17



= 0.579, p< 0.001

Figure 5.4.11 Mean Rates (Seconds per Minute) of Reciprocal Teacher-Student Task Talk for Sample N=53

The respective relationships indicate the level of association or congruity between teacher–student and student–teacher task talk for N=17 and N=53 (Figures 5.4.10 and 5.4.11). Teacher task talk to the target student related r=0.046 with

student on-task behaviour for N=17 and r=–0.332, p<0.02 for n=53 (Table 5.4.2). Correlations with student unwanted or competing behaviour were r=-0.004 for N=17 and 0.142 for N=53 (Table 5.4.4).

Commentary These results (relative rates and congruence) suggest a greater teacher responsiveness and control over the interactions for N=53 than N=17**.** Neither result indicate reciprocal task talk to contribute significantly to overall student on-task behaviour or student unwanted behaviour.

Teacher Praise

Table 5.4.7 Mean Rates (Incidents and Seconds per Minute) of Teacher Praise for Work and Behaviour and Correlations between The Means (Seconds per Minute) of Teacher Praise Differentiated and Combined with Student On-Task Behaviour for Samples N=17 and N=53

Teacher Praise:				**On Task Behaviour:**
n=17		**seconds/minute**	**incidents/minute**	**301/302/320**
teacher praise class for work	205	0.148	0.727272727	**-0.465**
teacher praise student for work	250	0.066	1	0.200
teacher praise other student for work	251	0.522	1	0.143
all teacher praise for work	205/250/251	0.737	1	-0.021
teacher praise behaviour of class	206	0.111	0.697	-0.043
teacher praise behaviour of student	260	0.030	0.364	0.309
teacher praise behaviour other student	261	0.210	0.939	-0.096
all teacher praise for behaviour	206/260/261	0.351	0.939	-0.027
all teacher praise work and behaviour	205/50/51/206/60/61	1.088	1	-0.035
n=53		**seconds/minute**	**incidents/minute**	**301/302/320**
teacher praise class for work	205	0.136	0.970	-0.148
teacher praise student for work	250	0.057	0.788	**-0.419**
teacher praise other student for work	251	0.693	1	0.044
all teacher praise for work	205/250/251	0.885	1	-0.149
teacher praise behaviour of class	206	0.072	0.970	0.227
teacher praise behaviour of student	260	0.009	0.242	-0.136
teacher praise behaviour other student	261	0.228	1	0.198
all teacher praise for behaviour	206/260/261	0.309	1	**0.293**
all teacher praise work and behaviour	205/50/51/206/60/61	1.194	1	-0.002

For sample N=17 (Table 5.4.7), the only relationships approximating significance were between teacher praise for work to the whole class (205) and student on-task behaviour (301/302/320, r=-0.465, p<0.10), and teacher praise to the target student for behaviour (r=0.309) and student on-task behaviour (301/302/320). These do not fall within the 95% confidence level adopted.

For sample N=53 teacher praise to the target student for work related moderately (r=-0.418, p<0.01) with student on-task behaviour, all teacher praise for behaviour, r=0.293, p<0.05, small to moderately.

For both N=17 and N=53 correlations between teacher praise to the target student for work (250) were of negative valence.

No significant correlations were obtained between all teacher praise for work (205/250/251) and student on-task behaviour (301/302/320) for either sample. No significant correlations were found between all teacher praise for work and behaviour combined (205/250/251/206/260/261) and student on-task behaviour (301/302/320) for either sample. A one interval lag on all teacher praise (205/250/251/206/260/261) and subsequent correlation with student on-task behaviour (301/302/320) indicated coefficients of r=0.070 for N=17 and r-0.055 for N=53, neither of which are significant. This juxtaposition indicated that teacher praise for work and behaviour combined did not relate with subsequent student on-task behaviour.

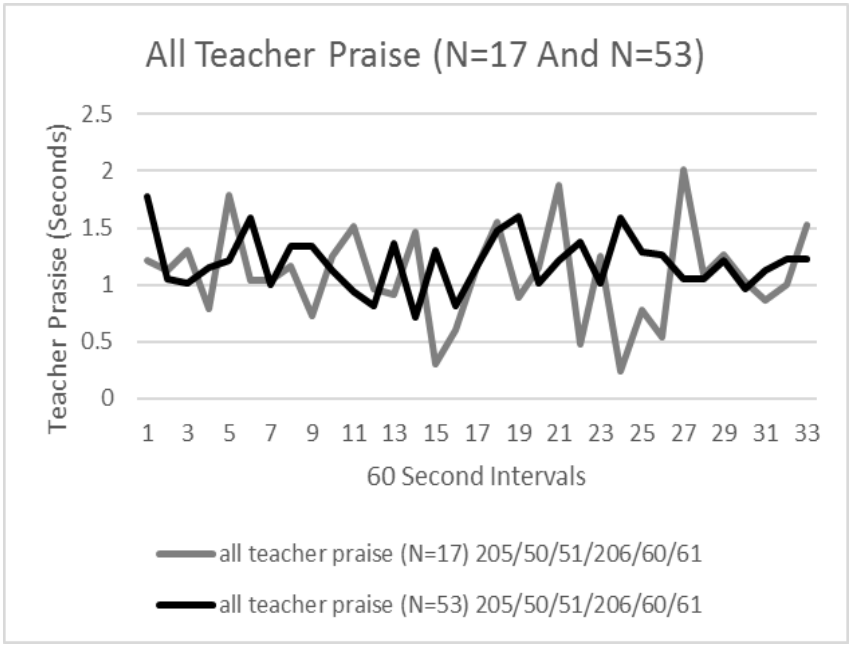
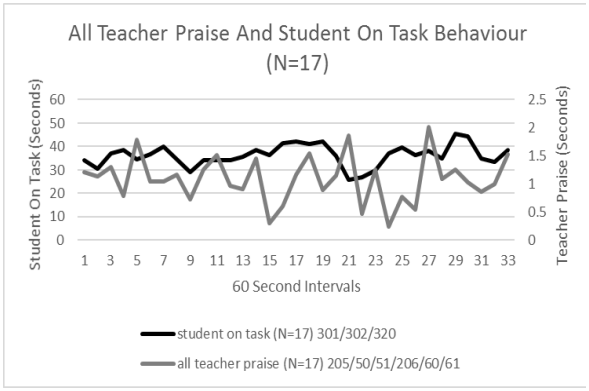


Figure 5.4.12 Mean Rates (Seconds per Minute) of All Teacher Praise for Work and Behaviour for Teachers having Expressed Management Difficulty (N=17) and those not having done so (N=53)

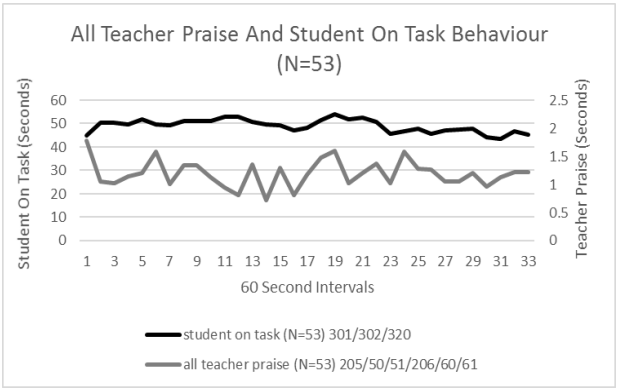
Figure 5.4.12 shows all teacher praise for work and behaviour for N=17 and N=53. Of note is the greater variability of teacher praise (205/250/251/206/260/261) for sample N=17 compared to N=53 (Figures 5.4.12, 5.4.13 and 5.4.14).



r=-0.002

two interval lag r=0.167

Figure 5.4.13 Mean Rates (Seconds per Minute) of All Teacher Praise and Student On Task Behaviour for Sample N=17



r -0.035

one interval lag r=-0.055

Figure 5.4.14 Mean Rates (Seconds per Minute) of All Teacher Praise and Student On Task Behaviour for Sample N=53

Figures 5.4.13 and 5.4.14 show all teacher praise with student on-task behaviour for samples N=17 and N=53 with respective correlations beneath. Contiguous relationships are both of negative valence and insignificant.

This was also the case when a two-interval lag was applied to N=17 and one interval lag to N=53, r=0.17 and -0.055 respectively. For the truncated data (22 intervals), N=53, the correlation coefficient was r=0.0428. Consequently, reducing the data in keeping with the higher correlation found between reprimands and unwanted or competing behaviour (both being subsequent events, Table 5.4.20) made minimal difference.

Table 5.4.8 Correlations of Mean Rates (Seconds per Minute) of Student On-Task Behaviour with Teacher Praise for Work (250) and Praise for Behaviour (260) to the Target Student (N=17)

N=17	**real time**	**one interval**	**two interval**	**three interval**
Student On Task Behaviour:	**recording**	**lag on**	**lag on**	**lag on**
		praise	**praise**	**praise**
	0	-1	-2	-3
correlation with teacher praise for work	0.200	-0.026	0.044	0.253
correlation with teacher praise for behaviour	0.309	0.076	-0.186	-0.026

Table 5.4.9 Correlations between Mean Rates (Seconds per Minute) of Student On-Task Behaviour with Teacher Praise for Work (250) and Behaviour (260) to the Target Student (N=53)

N=53	**real time**	**one interval**	**two interval**	**three interval**
Student On Task Behaviour	**recording**	**lag on**	**lag on**	**lag on**
		praise	**praise**	**praise**
	0	-1	-2	-3
correlation with teacher praise for work	**-0.419**	**-0.350**	-0.047	0.173
correlation with teacher praise for behaviour	-0.136	-0.088	-0.119	-0.052

No significant relationships were found between teacher praise to the target student for work or behaviour and student on-task behaviour for N=17 (Table 5.4.8). Significant negative correlations were found between teacher praise for work to the target student and student on-task behaviour both in real time and with a one interval lag (Table 5.4.9) for N=53. The relationships with praise for work both become positive in the two (N=17) and three interval Lag (N=53) although neither significantly so.

While teacher task talk greater than 50% of available time is sufficient to effect considerably improved on-task behaviour and reduce 'unwanted' or competing behaviour no similar positive relationships exists between teacher praise for work, praise for behaviour severally or combined, be it directed to the target student or the whole class, the target student and other students combined, and whether or not the data is lagged. In respect to the negative correlation obtained between teacher praise for work for N=53 and the negative valences of contiguous relationships, that praise for work offers increments to student on-task behaviour is questionable based on this data.

These results do not support Hypothesis H_4.

Hypothesis H_4 A high rate of teacher task talk would be associated with a high rate of student on-task behaviour and with praise being significantly related to both variables. *This would be evident in a significant positive correlation between teacher praise and student on-task behaviour given a high rate of teacher task talk. That is a conditional functional relationship.*

Teacher Proximity

Table 5.4.10 Mean Rates (Incidents and Seconds per Minute), and Correlations between the Mean Rates (Seconds per Minute) of Teacher Proximity to the Target Student and Teacher Behaviour Directed to the Target Student for Samples N=17 and N=53.

Teacher Proximity To Target Student, N=17				
Behaviour:	**Code:**	**seconds/minute**	**incidents/minute**	**correlation:**
teacher praises target student for work	250	0.066	1.000	-0.157
teacher praises target student for behaviour	260	0.030	0.364	-0.158
teacher reprimands target student	270	0.178	0.758	0.154
teacher task tralk to target student	220	1.216	0.970	0.197
teacher behaviour talk to target student	230	0.217	0.758	0.018
teacher social talk to target student	240	0.027	0.212	-0.045
student unwanted or competing behaviour	330/305/6/7/8/340/350/360	6.975	1.000	-0.023
student repetitive movements	308	0.134	0.182	0.361
Teacher Proximity To Target Student, N=53				
Behaviour:	**Code:**	**seconds/minute**	**incidents/minute**	**correlation:**
teacher praises target student for work	250	0.057	0.788	0.155
teacher praises target student for behaviour	260	0.009	0.242	0.070
teacher reprimands target student	270	0.028	0.606	0.260
teacher task talk to target student	220	1.034	1.000	0.076
teacher behaviour talk to target student	230	0.030	0.606	0.052
teacher social talk to target student	240	0.033	0.394	-0.076
student unwanted or competing behaviour	330/305/6/7/8/340/350/360	2.363	1.000	0.073
student repetitive movements	308	0.033	0.121	**-0.304**

No significant relationships were found between teacher proximity to the target student (201) and any teacher behaviour directed to the target student for either N=53 or N=17. Student repetitive movements related moderately and negatively with teacher proximity ($r=-0.303$, $p<0.05$). The same correlation, although not significant and of positive value, for N=17 was more elevated than any other ($r=0.360$).

Table 5.4.11 Mean Rates (Incidents and Seconds per Minute) of Teacher Proximity to the Target Student

Teacher Proximity To Target Student		**seconds/minute**	**incidents/minute**
(Code: 201):	N=17	6.59	0.97
	N=53	8.181	1

Commentary The lack of significant correlation teacher proximity and any teacher verbal behaviour is surprising given the rate (seconds per minute) of teacher proximity to the target student. The function may not be being measured in the current study, such as maintaining public visibility, maintaining oversight of student work without further participation, or retaining a focal non-contingent

presence. The elevated levels of teacher proximity are indicative of teacher mobility in the classroom.

Teacher Social Talk

Table 5.4.12 Mean Rates (Incidents per Minute and Seconds per minute) of Teacher Social Talk for Samples N=17 And N=53

Teacher Social Talk:	**Code:**		**Samples:**		
Behaviour:		**N=17**		**N=53**	
		seconds/minute	**incidents/minute**	**seconds/minute**	**incidents/minute**
teacher social talk to whole class	204	0.563	0.606	0.544	0.909
teacher social talk to student	240	0.026	0.212	0.033	0.393
teacher social talk to other student	241	0.232	0.909	0.61	1
all teacher social talk	204/240/241	0.822	0.970	1.188	1

All teacher social talk combined (204/240/241), to the class, to the target student and to other students summed was greater for sample N=53 (1.187 seconds per minute) than N=17 (0.822 seconds per minute) and dispersed over all intervals (Table 5.4.12).

Table 5.4.13 Correlation between the Mean Rates (Seconds per Minute) of all Teacher Social Talk and Student Social Talk to other Students, and Mean Rates (Seconds per Minute) of Student On-Task Behaviour and Student Unwanted Behaviour for Samples N=17 And N=53

Behaviour:			**Correlation:**	
	Behaviour Code:	**330**	**on task behaviour**	**unwanted behaviour**
teacher social talk N=17	204/240/241			
student social talk to other student	330	-0.226	-0.100	-0.219
teacher social talk N=53	204/240/241			
student social talk to other student	330	0.035	0.146	0.031

Table 5.4.13 shows no significant relationships with student social talk to other students, student on-task behaviour and student unwanted or competing behaviour indicating no deleterious effects on those behaviours.

Table 5.4.14 shows teacher social talk differentially and combined (240, 241,204/240/241) and reciprocal social talk from the target student and social talk to other students by the target student.

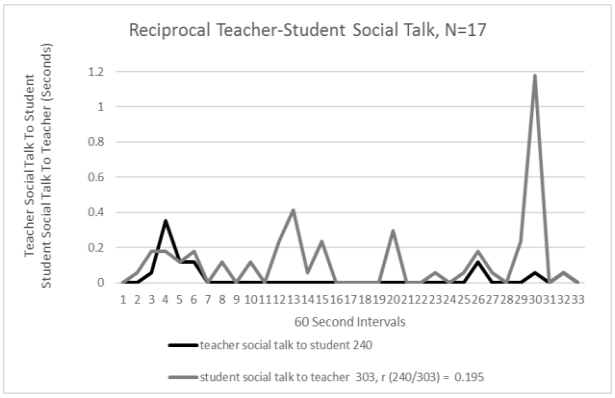
5.4.14 Mean Rates (Incidents and Seconds per Minute) of Teacher–Student and Student–Teacher Social Talk ('Opportunities to Respond') for Samples N=17 and N=53

Reciprocal Teacher-Student Social Talk.				
Behaviour:	**Code:**		**Samples:**	
		N=17		**N=53**
		seconds/minute	**incidents/minute**	**seconds/minute**
teacher social talk to student	240	0.026	0.212	0.033
student social talk to teacher	303	0.121	0.576	0.025
teacher social talk to other student	241	0.232	0.909	0.61
student social talk to other student	330	6.023	1	2.106
all teacher social talk	204/240/241	0.822	0.970	1.188

Teacher social talk to the target student and to other students is less for sample N=17 than N=53 both in time (seconds per minute) and incidents per minute. Social talk to the teacher by the target student is the reverse.

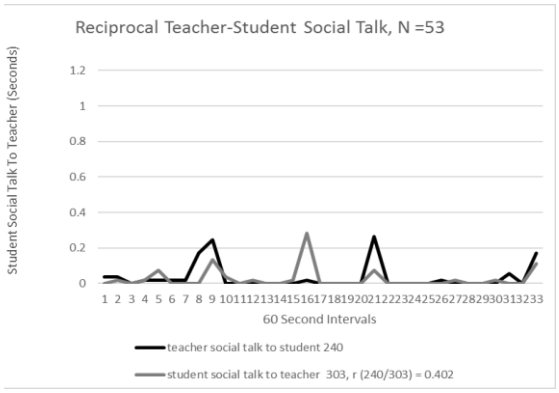
Reciprocal Teacher-Student Social Talk

Figures 5.4.15 and 5.4.16 show the reciprocal nature of social talk for samples N=17 and N=53.



r= 0.195

Figure 5.4.15 Mean Rates (Seconds per Minute) of Reciprocal Teacher-Student Social Talk N=17



r= 0.402, p< 0.01

Figure 5.4.16 Mean Rates (Seconds per Minute) of Reciprocal Teacher-Student Social Talk N=53

Figure 5.4.15 (N=17) shows protracted reciprocal teacher–student social talk at the beginning of class (seven minutes' duration) and what could be described as perseverative social talk to the teacher by the target student in the absence of reciprocal teacher–student social talk. The 'burst' over the last eight minutes of class appears an artefact of teacher reciprocation over that period. This is reflected

in the correlation between the two (r=0.195). Figure 5.4.16, N=53, shows a more reciprocal and hence controlled scenario (r=0.402, p<0.01), with an indication of student perseverative behaviour at the beginning of class.

The protracted reciprocal teacher–student social talk at the beginning of class for N=17 indicates that engaging in social talk at the outset of class is characteristic for several classes.

Table 5.4.15 Correlation between the Mean Rates (Seconds per Minute) of Teacher Social Talk Differentiated and Mean Rates (Seconds per Minute) of Teacher Reprimands and Behaviour Talk Severally and Combined for Samples N=17 and N=53

			N=17			
Behaviour:	**Code:**	**207/203**	**270/230**	**271/231**	**207/203/270/230/271/231**	
teacher social talk to whole class	204	-0.013	-0.380	-0.162	-0.198	
teacher social talk to student	240	0.196	-0.117	-0.048	0.065	
teacher social talk to other	241	-0.016	-0.231	-0.138	-0.155	
teacher social talk	204/240/241	-0.003	-0.414	-0.188	-0.218	
			N=53			
Behaviour:	**Code:**	**207/203**	**270/230**	**271/231**	**207/203/270/230/271/231**	
teacher social talk to whole class	204	**0.363**	0.152	**0.415**	**0.447**	
teacher social talk to student	240	-0.023	0.002	0.266	0.066	
teacher social talk to other	241	**0.387**	-0.243	**0.336**	**0.419**	
teacher social talk	204/240/241	**0.448**	-0.016	**0.481**	**0.530**	

No significant correlations were found for sample N=17 between teacher social talk and reprimand and behaviour talk.

For N=53, teacher social talk to the whole class, to other students and combined correlated significantly with reprimands and behaviour talk to the whole class (207/203), to other students (271/231) and all reprimands and behaviour talk (207/303/270/230/271/231) summed (Table 5.4.15).

A large relationship was found between all teacher social talk (r=0.530, p<0.001) and all teacher reprimands and behaviour talk for N=53.

Commentary All teacher social talk combined (204/240/241), to the class, to the target student and to other students summed was greater for sample N=53 (1.187 seconds per minute) than N=17 (0.822 seconds per minute) and dispersed over all intervals (Table 5.4.12). This is surprising as teacher social talk is the proactive pursuit of competing behaviour by the teacher.

The lack of significant relationships between teacher social talk and student social talk to other students, student on-task behaviour and student unwanted behaviour indicates no generalised deleterious effects on those behaviours.

The protracted reciprocal teacher–student social talk at the beginning of class for N=17 indicates engaging in social talk at the outset of class to be characteristic for a number of classes and subsequently, what could be described as perseverative social talk to the teacher by the target student in the absence of reciprocal teacher–student social talk (Figure 5.4.15). The burst over the last eight minutes of class appears an artefact of teacher reciprocation over that period. Figure 5.4.16, N=53, shows a more reciprocal and hence controlled scenario, there only being an indication of student perseverative behaviour at the beginning of class. The differences between the two are probably explained by the differences in the rates of teacher task talk to the whole class and combined for the respective samples. For N=53 the rate of teacher task talk to the whole class and combined 'automatically' limiting competing behaviour.

These results do not support the idea that teacher social talk is relationship building. In classes with a high relative rate of teacher task talk and lower rates of student unwanted or competing behaviour (N=53), the relation with teacher reprimand and behaviour talk indicates substantive input to re-orientate students to on-task behaviour.

Despite there being no significant relationships between teacher social talk and student on-task or unwanted behaviour, the perseverative nature of student social talk to the teacher for N=17, in the absence of teacher response (Figure 5.4.16), cannot be viewed as contributing positively to teacher–student relationships.

Teacher Reprimand and Behaviour Talk

Table 5.4.16 Mean Rates (Incidents and Seconds per Minute) of Teacher Reprimands, Behaviour Talk Differentiated and Combined, Mean Rates of Student Social Talk to Other Students as Component Parts of the Sum of Mean rates of all Teacher Reprimands and Behaviour Talk, and Student Unwanted Behaviour for N=17 and N=52

		N=17		N=53	
Behaviour:	**Behaviour Code:**	**seconds/minute**	**incidents/minute**	**seconds/minute**	**incidents/min**
teacher reprimands the whole class	207	0.834	1	0.160	1
teacher reprimands the target student	270	0.178	0.758	0.028	0.606
teacher reprimands other students	271	1.645	1	0.370	1
sum of teacher reprimands	207/270/271	2.658	1	0.559	1
teacher behaviour talk to the whole class	203	0.900	0.909	0.541	0.970
teacher behaviour talk to the target student	230	0.217	0.758	0.030	0.606
teacher behaviour talk to other students	231	1.221	1	0.609	1
sum of teacher behaviour talk	203/230/231	2.339	1	1.181	1
social talk to other student	330	6.023	1	2.106	1
sum reprimands and behaviour talk	207/203/270/230/271/231	4.996	1	1.739	1
student on task behaviour	301/302/320	36.241	1	45.579	1
student unwanted or competing behaviour	330/304/05/06/07/08/340/350/360	6.975	1	2.363	1
sum of teacher task talk	202/220/221	22.283	1	30.392	1
all teacher praise	205/50/51/206/60/61	1.088	1	1.194	1
student on task	301/302/320	36.241	1	49.030	1

Dispersion of behaviour across intervals is equivalent for both samples (Table 5.4.16).

The sample N=17 is 4.75 times more reprimand (207/270/271) 'rich' (seconds per minute) than sample N=53. The sum of teacher reprimands and behaviour talk (207/203/270/230/271/231) has occurred 2.87 times more in sample N=17 and unwanted or competing behaviour has occurred (330/303/304/3305/306/307/340/350/360) 2.95 times more.

Table 5.4.17 Differences between Mean Rates(Seconds per Minute) of Teacher Task Talk Severally and Combined for Samples N=17 and N=53

Teacher Task Talk (Seconds Per Minute):		**N=17**	**N=53**	**Difference:**
teacher task talk to whole class	202	13.307	16.781	3.474
teacher task talk to target and other students	220/221	8.977	13.611	4.634
sum of teacher task talk	202/220/221	22.283	30.392	8.109

All teacher task talk (202/220/221) for N=53 is 1.36 times more than N=17. The teacher focus on 'wanted' behaviour (on-task related behaviour) in sample N=53 is considerably greater than in N=17, and the focus on 'unwanted' behaviour considerably less (Table 5.4.17).

Table 5.4.18 Percentages of Mean Rates (Seconds per Minute) of Individual Behaviour Constituting the Summation of that Behaviour and the Mean Difference (Seconds per Minute) between the Samples N=17 And N=53

		N=17	N=53	mean difference
		% of total	% of total	(N=53) - (N=17)
Behaviour:	**Behaviour Code:**			**Seconds/Minute**
teacher reprimands the whole class	207	31.388	28.659	-0.674
teacher reprimands the target student	270	6.707	5.015	-0.150
teacher reprimands other students	271	61.905	66.325	-1.275
sum of teacher reprimands	207/270/271			-2.099
teacher task talk the whole class	202	59.715	55.215	3.474
teacher task talk the target student	220	5.456	3.403	-0.181
teacher task talk other students	221	34.829	41.382	4.816
sum of teacher task talk	202/220/221			8.109
teacher behaviour talk to the whole class	203	38.491	45.811	-0.359
teacher behaviour talk to the target student	230	9.299	2.567	-0.187
teacher behaviour talk to other students	231	52.210	51.622	-0.612
sum of teacher behaviour talk	203/230/231			-1.158
social talk to other student	330	86.353	89.136	-3.917
sum reprimands and behaviour talk	207/203/270/230/271/231	53.193	32.117	-3.257
sum of teacher task talk	202/220/221	100.000	100.000	8.109
student unwanted or competing behaviour	330/305/6/7/8/340/350/360	86.353	89.136	-4.612

In both samples, teacher verbal behaviour, aside from all teacher task talk (202/220/221), is directed toward the target student and other students more than to the whole class. With respect to teacher task talk, 40.27% in N=17 is directed toward the target student and other students, for N=53, 44.78% is. This differential is constituted of the difference between teacher task talk to the whole class (202). In N=53 this constitutes 55.21%. of all teacher task talk (202/220/221,) and for N=17, 59.71%

This indicates a greater relative focus of teachers in N=53 with student on-task behaviour than for N=17.

The summation of teacher reprimands and behaviour talk is constituted of 53.19% reprimands (207/270/271) for sample N=17 and 32.12% for N=53, the complement being behaviour talk (206/260/261). Teacher behaviour talk was defined as qualitative negative or corrective statement about conduct. Correlations between these two categories are shown in the following table, maximum correlation for N=17 being with a two-interval lag on reprimands ($r=0.289$), for N=53 the maximum correlation was with the real-time recording ($r=0.432$, $p<0.01$).

Table 5.4.19 Correlations between Mean Rates(Seconds per Minute) of all Teacher Reprimands and all Teacher Behaviour Talk with Lags on the Means(Seconds per Minute) of Teacher Reprimand for Samples N=17 And N=53

Behaviour:	Code:	real time	1 interval lag	2 interval lag	3 interval lag
all teacher reprimands	207/270/271				
all teacher behaviour talk (N=17)	203/230/231	0.079	0.237	0.289	-0.001
all teacher behaviour talk (N=53)	203/230/231	**0.432**	0.106		

This is similar to the optimal correlations found between Mean Rates of all teacher reprimand and behaviour talk with the Mean Rate of student unwanted behaviour (Table 5.4.20).

Table 5.4.20 Correlations between Mean Rates (Seconds per Minute) of all Teacher Reprimand and Behaviour Talk with Mean Rates of Student Unwanted Behaviour, Lags on Teacher Reprimand and Behaviour Talk for Samples N=17 And N=53

Correlation Of Reprimand And Behaviour Talk				
With Student Unwanted Behaviour				
lags	**Correlations**			
Intervals	N=17		N=53	
real time recording	0.027		0.078	
1	0.360		**0.402**	P< 0.01
2	**0.567**	P< 0.05	0.035	

This data shows the protracted nature of reprimand and behaviour talk with N=17 relative to N=53. The greater correlation between all teacher reprimand and all teacher behaviour talk for N=53 being the real-time recording, indicating behaviour talk to be an integral part of reprimand. A one interval lag and the relationship is not significant. For N=17, the maintenance of elevated relationships indicates the protracted nature of both.

For N=17 student unwanted or competing behaviour (330/304/305/306/307/308/340/350/360), 86.35% of this is constituted of target student social talk to other students (330), in N=53 this is 89.14% (Table 5.4.18). This indicates N=17 has a greater percentage of more extreme behaviour than N=53.

Figure 5.4.17 shows the greater variability apparent regarding teacher reprimands and behaviour talk (203/230/231/207/270/271) for N=17 relative to N=53.

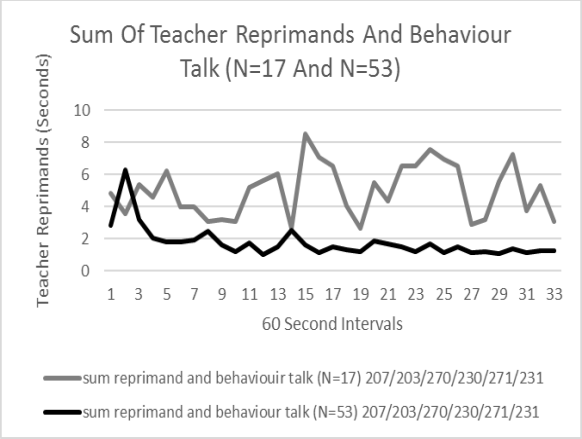
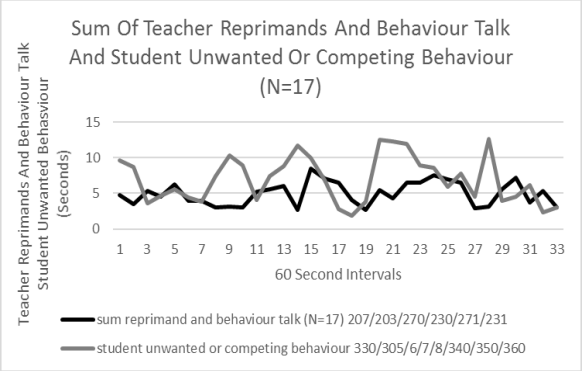
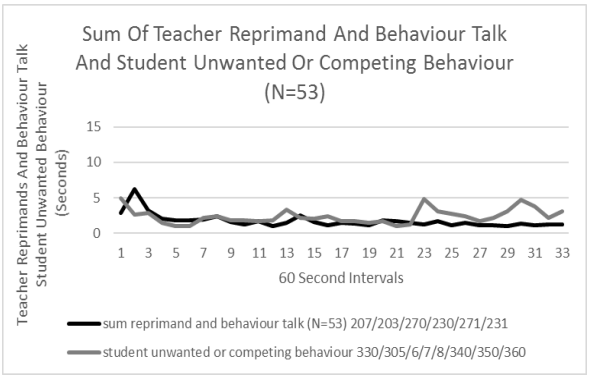


Figure 5.4.17 Mean Rates (Seconds per Minute) of Teacher Reprimands and Behaviour Talk for Teachers Having Expressed Management Difficulty (N=17) and those not having done so (N=53)



r= 0.027

Figure 5.4.18 Mean Rates (Seconds per Minute) of Teacher Reprimands and Behaviour Talk and Student Unwanted Behaviour (N=17)



r= 0.078

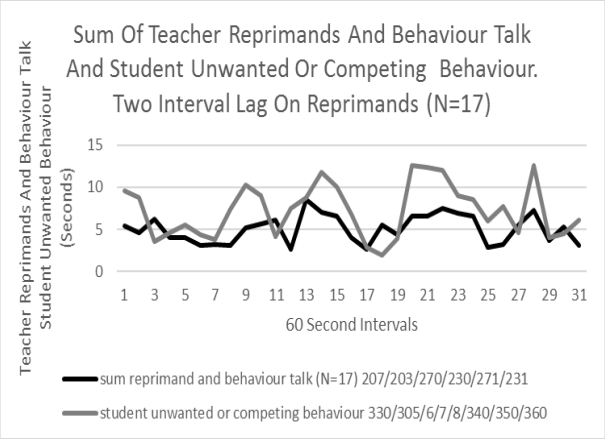
Figure 5.4.19 Mean Rates (Seconds per Minute) of Teacher Reprimands and Behaviour Talk and Student Unwanted Behaviour (N=53)

Figures 5.4.18 and 5.4.19 show the total of teacher reprimands and behaviour talk (203/230/231/207/270/271) and student unwanted or competing behaviour (304/05/06/07/08/330/340/350/360) for samples N=17 and N=53. No relationships were found between teacher reprimands and behaviour talk, and student unwanted or competing behaviour (r=0.027 and r=0.078, Figure 5.4.18 and Figure 5.4.19 respectively) when compared contiguously. This would indicate that reprimand and behaviour talk was not related to the behaviour that it was presumed to reduce. Teacher reprimand and behaviour talk are subsequent events, however, and are looked at further in that context.

With a two-interval lag on reprimands for sample N=17 (Figure 5.4.20) a large relationship was found between reprimands and behaviour talk and student

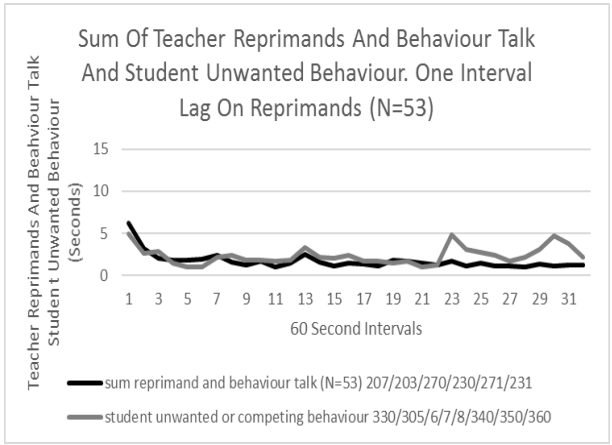
unwanted or competing behaviour (r=0.567, p<0.001). For sample N=53 (Table 5.4.18, Figure 5.4.21) a moderate to large relationship (r=0.401, p<0.01) was found. Again, there is greater duration of reprimand and behaviour talk and variability in the sample of those teachers expressing management difficulty and those not doing so (N=53). Lagging N=17 by one interval (60 seconds) realised a correlation of r=0.36 which is not significant. Lagging N=53 by two intervals (120 seconds) realised a correlation coefficient of r=0.03 (Table 5.4.19). The lags adopted appear optimal for the respective data sets.

For those teachers not expressing difficulty with teaching, there was an



r=0.567

Figure 5.4.20 The Mean Rates (Seconds per Minute) of Teacher Reprimands and Behaviour Talk and Mean Rates (Seconds per Minute) of Student Unwanted Behaviour (N=17) – Two Interval Lag on Reprimands

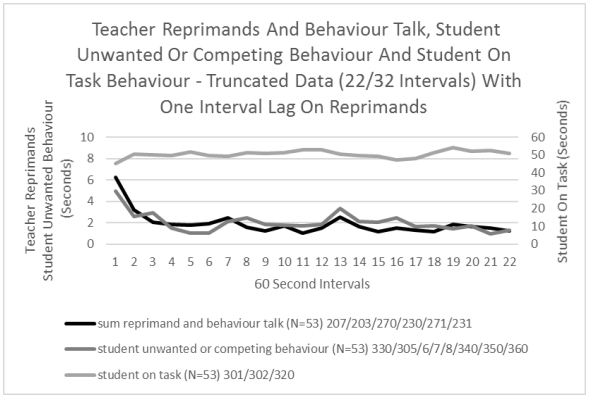


r=0.401

Figure 5.4.21 Mean Rates (Seconds per Minute) of Teacher Reprimands and Behaviour Talk and Mean Rates (Seconds per Minute) of Student Unwanted Behaviour (N=53) – One Interval Lag on Reprimands

initial high (5 seconds) level of teacher reprimand and behaviour talk corresponding with the initial equivalent duration per minute of unwanted or competing behaviour – both of which reduced equivalently. This initial 'burst' of reprimand is also apparent for sample N=17 (Figure 5.4.20).

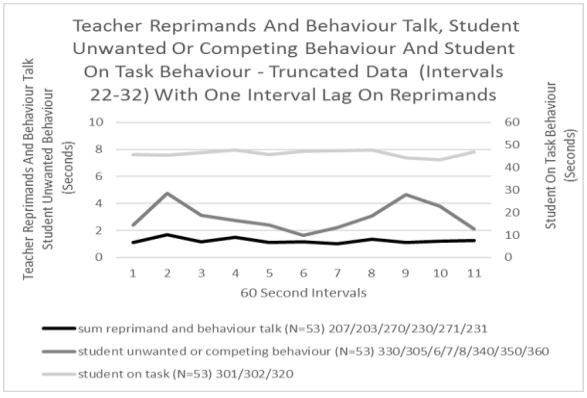
Figure 5.4.21 (N=53) shows an increase in unwanted or competing behaviour after interval 22. Truncating the data for the sample N=53 to 22 intervals (Figure 5.4.22) realised a correlation coefficient of r=0.797, p<0.001, a large effect size, between teacher reprimands and behaviour talk and student unwanted or competing behaviour. The remainder of the data, intervals 22 to 32, and respective correlations are shown in Figure 5.4.23.



r=0.797, p<0.001

r=0.460, p<0.001

Figure 5.4.22 One Interval Lag on the Mean Rate (Seconds per Minute) of Teacher Reprimands and Behaviour Talk, Student On-Task Behaviour and Student Unwanted Behaviour. Truncated Data (N=53, 1 to 22 Intervals)



r=-0.554, p<0.001

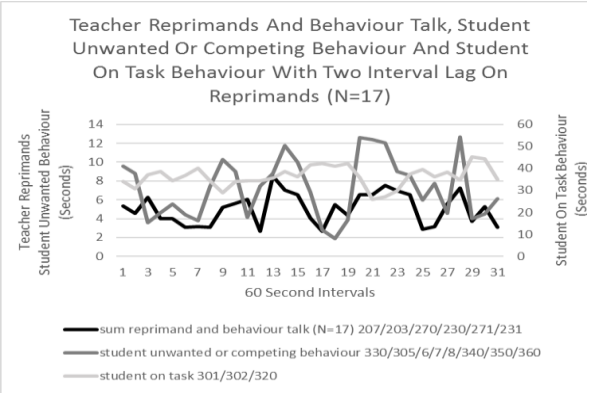
r=0.111

Figure 5.4.23 One Interval Lag on the Mean Rate (Seconds per Minute) of Teacher Reprimands and Behaviour Talk, Student On-Task Behaviour and Student Unwanted Behaviour. Truncated Data (N=53, 22 to 32 Intervals)

The corresponding relationship between teacher reprimands and behaviour talk with student on-task behaviour was r=-0.554, p<0.001. For the remaining intervals, the respective correlations were r=0.460, p< 0.001 and r=0.111. For the truncated data, this results in a large correspondence between teacher reprimands and behaviour talk and student unwanted behaviour for the first 22 minutes. Table 5.4.21 shows the rates (seconds per minute) of the data separated – teacher reprimands and behaviour talk are less, teacher task talk is more, student on-task behaviour is more and student unwanted or competing behaviour is less in the first 22 minutes of class. The mean rates per second are presented in Table 5.4.21.

Table 5.4.21 The Mean Rates (Seconds per Minute) of Teacher Reprimand and Behaviour Talk, Teacher Task Talk, Student On-Task Behaviour and Student Unwanted or Competing Behaviour for Intervals 1 To 22 and 22 to 31 for Sample N=53

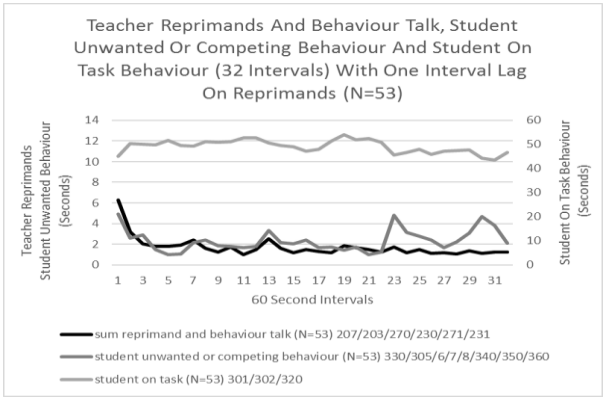
N=53			
with one interval lag on all teacher reprimand and			
behaviour talk (207/203/270/230/271/231)		**Mean Of Intervals**	**Mean Of Intervals**
Behaviour:	**Code:**	**1 To 22 (Seconds)**	**22 To 31 (Seconds)**
sum reprimand and behaviour talk	207/203/270/230/271/231	1.907	1.247
student unwanted or competing behaviour	330/305/6/7/8/340/350/360	2.015	2.997
student on task	301/302/320	50.453	46.247
teacher task talk	202/220/221	30.889	29.921



r=0.567, p< 0.02

r=-0.201

Figure 5.4.24 The Mean Rates (Seconds per Minute) of Teacher Reprimands and Behaviour Talk, Student Unwanted Behaviour and Mean Rates (Seconds per Minute) of Student On-Task behaviour for Sample N=17



r=0.402, p<0.01

r=-0.370

Figure 5.4.25 The Mean Rates (Seconds per Minute) of Teacher Reprimands and Behaviour Talk, Student Unwanted Behaviour and Mean Rates (Seconds per Minute) of Student On-Task Behaviour for Sample N=53

The correlations beneath the figures show the moderate to large relationships between teacher reprimands and behaviour talk and student unwanted behaviour for both samples, similarly elevated albeit insignificant negative relationships with student on-task behaviour given a one interval lag on reprimands and behaviour talk for sample N=53 and a two-interval lag for N=17. This indicates a higher correspondence of teacher reprimand and behaviour talk with unwanted or competing student behaviour for N=17 than N=53, overall, however not in respect to the truncated data for N=53 which shows a correlation of r=0.797 with student unwanted behaviour indicating a very high correspondence for the first 22 minutes, and a negative correlation with student on-task behaviour, r=-0.554.

Both N=17 and N=53 show elevated rates of teacher reprimand and behaviour talk at the outset of class.

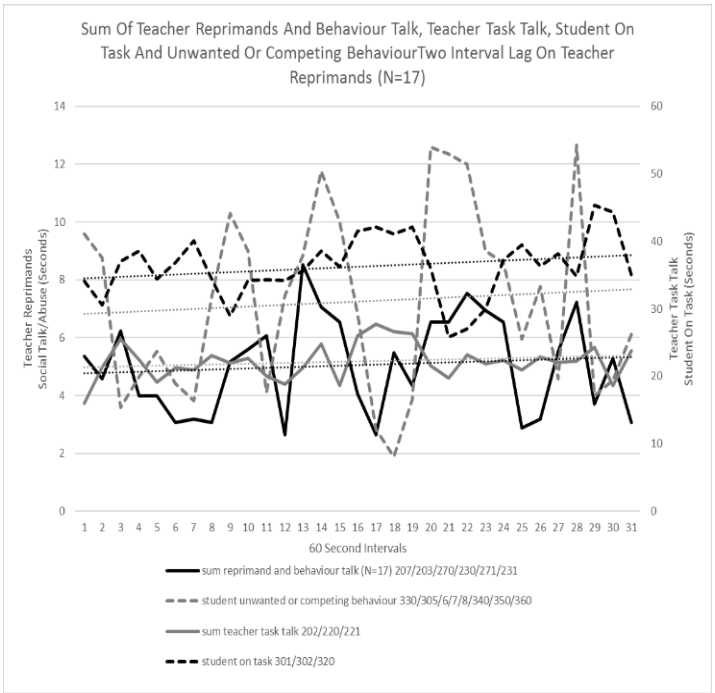


Figure 5.4.26 The Mean Rates (Seconds per Minute) of Teacher Reprimands and Behaviour Talk, Teacher Task Talk, Student On-Task Behaviour and Student Unwanted behaviour, Two Interval Lag on Teacher Reprimands and Behaviour Talk, Sample N=17.

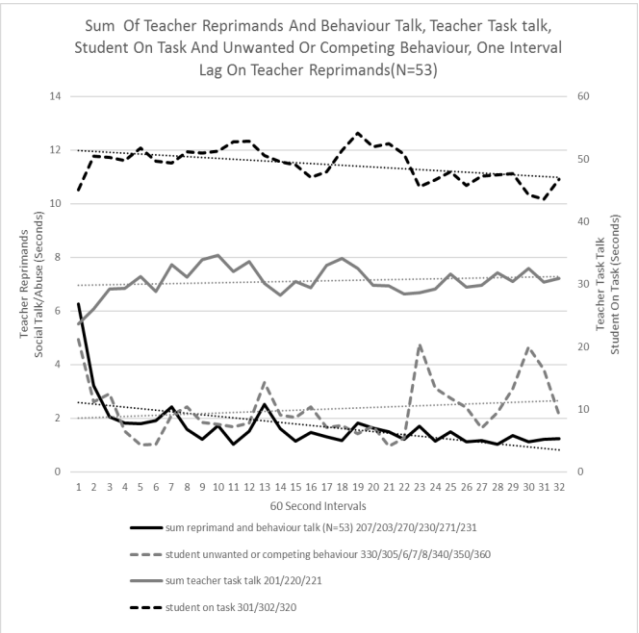


Figure 5.4.27 Mean Rates (Seconds per Minute) of Teacher Reprimands and Behaviour Talk, Teacher Task Talk, Student On-Task Behaviour and Student Unwanted Behaviour, One Interval Lag on Teacher Reprimands and Behaviour Talk, Sample N=53

Figure 5.4.26 and Figure 5.4.27 show the same data with the addition of all teacher task talk with trend lines added

Trend lines are:

Student on-task behaviour:

y(N=17) = 0.114x + 24.428 y(N=53) = -0.138x + 51.435

Sum of teacher task talk:

y(N=17) = 0.068x + 21.262 y(N=53) = 0.046x + 29.773

Student unwanted or competing behaviour:

y(N=17) = 0.028x + 6.796 y(N=53) = 0.021x + 1.995

Sum of teacher reprimand and behaviour talk:

y(N=17) = 0.019x + 4.742 y(N=53) = -0.058x + 2.659

Table 5.4.22 Correlations between The Mean Rates (Seconds per Minute) of all Teacher Task talk, all Teacher Reprimands and Behaviour Talk and Student On-Task Behaviour and The Mean Rates (Seconds per Minute) of Student Unwanted Behaviour with a Two Interval Lag on Reprimands for N=17 and a One Interval Lag for Sample N=53

Correlations Between Teacher Task Talk,		**N=17**		**N=53**	
Teacher Reprimands And Behaviour Talk And		on task	unwanted	on task	unwanted
Student On Task And Unwanted Behaviour:		behaviour	behaviour	behaviour	behaviour
all teacher task talk	202/220/221	0.330	-0.370	**0.382**	**-0.374**
all teacher reprimands and behaviour talk	330/304/5/6/7/8/340/350/360	-0.019	**0.567**	-0.089	**0.402**

Correlations in Table 5.4.22 are consistent for both samples in that the same relationships are elevated and of the same valence even if not significantly so. Teacher reprimands and behaviour talk have a moderate to large correspondence with student unwanted behaviour, and all teacher task talk correlates moderately and positively with student on-task behaviour and negatively with student unwanted behaviour.

For N=17, as reflected by the trend lines and equations, all teacher and student behaviour increases over the course of the class, principally student on-task behaviour and teacher task talk. Figure 5.4.26, (N=17), shows teacher reprimands and behaviour talk and teacher task talk increasing minimally over the course of the

class. Student on-task behaviour and unwanted or competing behaviour increase more so.

For N=53, student on-task behaviour decreases mostly over the course of the class followed by all teacher reprimands and behaviour talk. Student unwanted behaviour increases most, accounted for by the rise after 22 minutes, followed by teacher task talk.

The y intercepts (the constants) show student on-task behaviour and teacher task talk beginning at higher rates and student unwanted or competing behaviour and student reprimands and behaviour talk beginning at lesser rates than N=17.

Commentary All teacher task talk (202/220/221) for N=53 is 1.36 times more than N=17. In N=53, 55.21% of all teacher task talk (202/220/221) is directed to the whole class, for N=17, this is 59.71%. This indicates a greater relative focus of teachers in N=53 with student on-task behaviour (Table 5.4.16). The summation of teacher reprimands and behaviour talk is constituted of 53.19% reprimands (207/270/271) 46.81% behaviour talk (206/260/261) for sample N=17 and 32.12% reprimand and 67.88% behaviour talk for N=53 (Table 5.4.18). The reduced rates of teacher task talk in N=17) appear related to considerably lesser rates of student on-task behaviour, greater rates of unwanted behaviour (with a greater component of extreme behaviour (Table 5.4.18)) and reprimand (relative to behaviour talk (Table 5.4.16).) than for N=53 with higher rates of teacher task talk and greater focus on on-task behaviour.

The teacher focus on ‘wanted’ behaviour (on-task behaviour) in sample N=53 is considerably greater than in N=17, and the focus on ‘unwanted’ behaviour considerably less.

It appears that a high correspondence between teacher reprimands and behaviour talk and unwanted or competing behaviour for the first 22 minutes of class time whilst maintaining teacher task talk at a high level (greater than 50% of time) contains student unwanted behaviour sufficiently for student on-task behaviour to persist at a high level over time.

There is greater duration of reprimand and behaviour talk and variability in the sample of those teachers expressing management difficulty and those not doing so (N=53). This may reflect a tendency by teachers in N=17 to 'follow' the unwanted or competing behaviour with reprimands, reprimands being of greater duration (seconds per minute) both within and across intervals (Table 5.4.16, Figure 5.4.18).

The greater variability in sample N=17 is manifest in the spaghetti figure (Figure 5.4.26), the very nature of which must reflect an over-responsivity or reactivity to events rather than the pursuit of a planned learning agenda, compared with N=53 (Figure 5.4.27). The lags adopted appear optimal for the respective data sets. Lagging N=17 by one interval (60 seconds) realised a correlation of r=0.36 which is not significant. Lagging N=53 by two intervals (120 seconds) realised a correlation coefficient of r=0.03 (Table 5.4.19).

Figure 5.4.21 (N=53) shows an increase in unwanted or competing behaviour after interval 22. Truncating the data for the sample N=53 to 22 intervals with a one interval lag on reprimand and behaviour talk (Figure 5.4.22) realised a large relationship and effect size ($r=0.797$, $p<0.001$) between teacher reprimands and behaviour talk and student unwanted or competing behaviour. These results indicate a high correspondence between teacher reprimand and behaviour talk combined and student unwanted behaviour for this period, a ratio of 1:1 between reprimand and behaviour talk for the first 22 minutes and 0.45:1 for the remainder.

These results suggest different contingencies are in operation, for on-task behaviour teacher task talk predominantly, for unwanted behaviour, reprimand and behaviour talk in conjunction with teacher task talk.

Teacher Reprimand and Behaviour Talk (Cross-lagged Correlations)

Table 5.4.23 Correlation between the Mean Rates (Seconds per Minute) of Teacher Reprimand of the Target Student (270) and the Mean Rates (Seconds per Minute) of Student On-Task Behaviour and Student Unwanted Behaviour with Lags on Teacher Reprimands for Samples N=17 and N=53

N=17	**one interval lag on**	**real time**	**one interval**	**two interval**	**three interval**	**four interval**
Correlation:	**unwanted behaviour**	**recording**	**lag on**	**lag on**	**lag on**	**lag on**
			reprimands	**reprimands**	**reprimands**	**reprimands**
	-1	0	-1	-2	-3	-4
correlation reprimand and unwanted behaviour	0.192	0.309	0.305	0.101	0.119	0.236
correlation reprimand and on task behaviour	-0.086	-0.086	-0.150	-0.237	-0.282	-0.267
N=53	**one interval lag on**	**real time**	**one interval**	**two interval**	**three interval**	**four interval**
Correlation:	**unwanted behaviour**	**recording**	**lag on**	**lag on**	**lag on**	**lag on**
			reprimands	**reprimands**	**reprimands**	**reprimands**
	-1	0	-1	-2	-3	-4
correlation reprimand and unwanted behaviour	**-0.302**	-0.202	0.200	0.131	0.119	0.261
correlation reprimand and on task behaviour	-0.013	-0.013	**-0.325**	-0.172	-0.097	**-0.351**

For N=17 (Table 5.4.23), correlations between teacher reprimand of the target student (270) and student unwanted behaviour are r=0.309 and r=-0.086 for the correlation between teacher reprimand and student on-task behaviour. Juxtaposing the data by a one interval lag on reprimands to show congruence of occurrence between reprimands and both unwanted behaviour and on-task behaviour a high association would be expected with unwanted behaviour representing congruence between reprimand and unwanted behaviour. A low correlation with student on-task behaviour would be expected representing a corresponding suppression effect on on-task behaviour. Subsequent lags represent the progressive relationships over time.

The lags differentially represent real time data, one lag represents congruence between the variables and two lags the consequential relationship.

The sustained and increasing negative relationships between teacher reprimand and student on-task behaviour over intervals (lags) for N=17 (Table 5.4.23) indicate a protracted suppressant effect and a suppressant effect on unwanted behaviour after the second lag albeit this relationship never acquiring a negative value. That these correlations are not significant, indicates reprimand is not very effective at suppressing unwanted behaviour and that a negative effect perseveres on on-task behaviour over time.

For N=53 (Table 5.4.23) correlations between teacher reprimand of the target student and student unwanted behaviour are r=0.200 and r=-0.325, p<0.02 for the correlation between teacher reprimand and student on-task behaviour. The latter representing a medium negative effect size. Correlations decrease substantially at the two-interval lag point (4) and continue until the third interval (lag, point 5) indicating a lesser suppressant effect on unwanted behaviour than N=17 and lesser negative impact on on-task behaviour to that point.

Table 5.4.24 Correlation between the Mean Rates (Seconds per Minute) of all Teacher Reprimand and Behaviour Talk (203/230/231/207/270/271) and the Mean Rates (Seconds per Minute) of Student On-Task Behaviour and Student Unwanted Behaviour with Lags on Teacher Reprimands for Samples N=17 And N=53

N=17	**one interval lag on**	**real time**	**one interval**	**two interval**	**three interval**	**four interval**
Correlation:	**unwanted behaviour**	**recording**	**lag on**	**lag on**	**lag on**	**lag on**
			reprimands	**reprimands**	**reprimands**	**reprimands**
	1	0	-1	-2	-3	
correlation reprimand and unwanted behaviour	-0.201	0.027	0.360	**0.567**	0.398	0.153
correlation reprimand and on task behaviour	0.107	0.107	-0.056	-0.370	-0.402	-0.200
N=53	**one interval lag on**	**real time**	**one interval**	**two interval**	**three interval**	
Correlation:	**unwanted behaviour**	**recording**	**lag on**	**lag on**	**lag on**	
			reprimands	**reprimands**	**reprimands**	
	1	0	-1	-2	-3	
correlation reprimand and unwanted behaviour	-0.071	0.078	**0.402**	**-0.353**	-0.158	
correlation reprimand and on task behaviour	0.157	0.157	-0.089	**0.481**	**0.336**	

When all teacher reprimands and behaviour talk are combined, a one interval lag on reprimands and behaviour talk relative to student unwanted and on-task behaviour for N=17 (Table 5.4.24) realised correlations of r=0.360 and r=-0.056; a two-interval lag correlations of r=0.567, (p<0.05) and -0.370 and a three-interval lag correlations of r=0.398 and r=-0.402 respectively. The two-interval lag shows a greater congruence of teacher reprimands and behaviour talk and student unwanted behaviour. The correlation with unwanted behaviour persists at a high rate over lags of one, two and three intervals. The negative correlations with student on-task behaviour persist over a similar time frame. This indicates a protracted reprimand and behaviour talk and persistent negative impact on student on-task behaviour – a belated maximum correspondence between teacher reprimands and behaviour talk and student unwanted behaviour maintaining for three intervals. That the latter correlation did not become negative indicates that reprimand and behaviour talk were not very effective at suppressing student unwanted behaviour for N=17.

For N=53 (Table 5.4.24) a one interval lag realised a moderate to large relationship of r=0.401, p< 0.01 between teacher reprimand and behaviour talk and student unwanted behaviour. The correlation with student on-task behaviour was not significant (r=-0.088). Given a two interval lag the correlation with student unwanted behaviour was small to moderate (r=-0.353, p< 0.02), with student on-task behaviour indicated a moderate to large effect size (r=0.481, p<0.001). With a three interval lag the respective correlations were r=-0.158 and r=0.336, p<0.02 (small to moderate effect size). These results indicate that teacher reprimand and behaviour talk had a moderate suppressing effect on student unwanted behaviour and positive effect on student on-task behaviour within a two-interval time frame.

Table 5.4.25 Correlation between the Mean Rates (Seconds per Minute) of Student On-Task Behaviour and the Mean Rates (Seconds per Minute) of Student Unwanted Behaviour with Teacher Task Talk Differentiated and Combined for Samples N=17 and N=53

Behaviour:	**Code:**	**Correlation With Student On Task Behaviour:**			
		N=17	**N=53**	**Significance:**	
teacher task talk to whole class	202	0.184	**0.600**	P< 0.001	
teacher task talk to target student	220	0.047	**-0.332**	P< 0.02	
teacher task talk to other	221	0.021	**-0.341**	P< 0.02	
sum of teacher task talk	202/220/221	0.328	**0.382**	P< 0.01	
		Correlation With Student Unwanted Behaviour:			
		N=17	**N=53**	**Significance:**	
teacher task talk to whole class	202	-0.195	**-0.545**	P< 0.001	
teacher task talk to target student	220	-0.004	0.142		
teacher task talk to other students	221	-0.030	**0.330**	P< 0.02	
all teacher task talk	202/220/221	-0.343	**-0.374**	P< 0.01	

Correlations were all higher for teacher task talk directed toward the whole class and combined compared to that directed to the individual student (Table 5.4.25). Relationships between teacher task talk to the whole class (202) and student on-task and unwanted behaviour showed moderate to large effect sizes for N=53. No similar relationships were found for N=17.

A high rate of teacher task talk is the defining condition under which reprimands and behaviour talk reduce student unwanted or competing behaviour and maintain a high rate of student on-task behaviour. These results are consistent with Hypothesis $H_{3,}$ which stated that: a high rate of teacher task talk is the defining condition under which reprimands and behaviour talk reduce student unwanted or competing behaviour and maintain a high rate of student on-task behaviour. The medium to large relationships and effect sizes between rates of teacher task talk, teacher reprimands and behaviour talk and student unwanted or competing

behaviour, and student on-task behaviour in classroom settings. Hypothesis H3 can be considered to be supported Hypothesis H_3

Hypothesis H_3 A high rate of teacher task talk is the defining condition under which reprimands and behaviour talk reduce student unwanted or competing behaviour and maintain a high rate of student on-task behaviour. *This would be evident in fewer reprimands and behaviour talk, in reprimands and behaviour talk being of shorter duration, greater association of reprimand and behaviour talk with unwanted behaviour, and subsequently, a significant negative relationship between teacher reprimands and behaviour talk and student unwanted behaviour, and a significant positive relationship with student on-task behaviour, for those teachers evidencing high rates of teacher task talk. This indicating a conditional functional relationship.*

Commentary Juxtaposing reprimands directed to the target student with student on-task and unwanted behaviour resulted in a small to moderate negative relation being found between reprimand and on-task behaviour for N=53. No significant correlations at one interval were found that would indicate correspondence between reprimand and unwanted behaviour. That is moving the data for teacher reprimand by one interval to reflect the subsequent nature of reprimand and a further interval to reflect the subsequent effect of the reprimand (Tables 5.4.23 and 5.4.24).

When all teacher reprimand and behaviour talk were combined by target (Table 5.4.24), the results indicate the protracted nature of the reprimand behaviour talk process and an inability for it to suppress student unwanted behaviour for sample N= 17. For N=53, the results indicate a relatively high correspondence between teacher reprimand and behaviour talk and student unwanted behaviour and that teacher reprimand and behaviour talk had a moderate suppressing effect on student unwanted behaviour, and positive (medium to large) effect on student on-task behaviour within a two-interval time frame.

Correlations between teacher task talk to the whole class (202) and combined (all targets) realised moderate to large relationships with student on-task

behaviour and moderate and negatively with student unwanted behaviour for N=53 (Table 5.4.25). No significant relations were found for N=17.

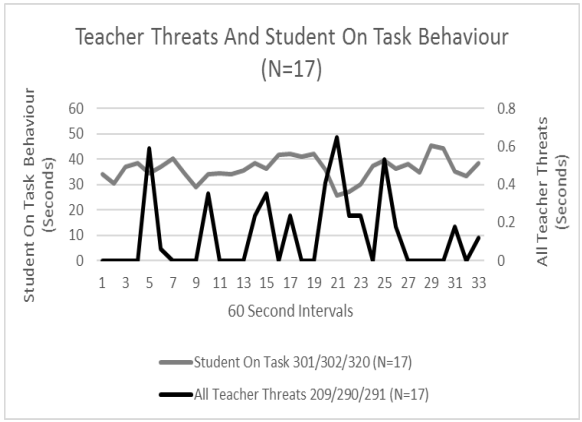
Considering these results alongside those presented in Table 5.4.16, reprimands and behaviour talk may simply gain their effectiveness at suppressing unwanted behaviour and increasing on-task behaviour due to the greater levels (rates of 50% of available time) of teacher task talk within and across intervals. That inherently this may limit any of the ongoing negative effects, including affect, associated with protracted reprimand and re-orientate students to an on-task focus.

Conversely, that low levels (rates of 37% of available time) of teacher task talk within and across intervals results in a loss of significant relationships between teacher task talk and student on-task and unwanted or competing behaviour. Further that this results in greater variability across all other teacher–student behaviour, particularly in lower rates of student on-task behaviour and greater rates of unwanted or competing behaviour.

Teacher Threats

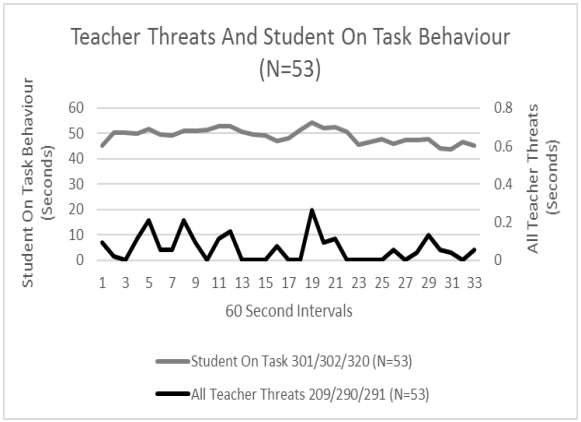
Student on-task behaviour could be said to be reflecting a ‘burst’ over the last six minutes in sample N=17 (Figure 5.4.6 and 5.4.28). This may be an artefact of the corresponding ‘peak’ of teacher threats as evidenced in the following figure (N=17, 5.4.28), which precedes this.

Seconds per minute (Table 5.4.26) and incidents per minute rates indicated that threats occurred more times per interval for N=53 than N=17, although for N=17 threats occurred more than twice the time (seconds per minute) for N=17 than N=53.



r=-0.306

Figure 5.4.28 The Mean Rates (Seconds per Minute) of Teacher Threats and Student On Task Behaviour (N=17)



r= 0.435, p<0.01

Figure 5.4.29 The Mean Rates (Seconds per Minute) of Teacher Threats and Student On Task Behaviour (N=53)

Contiguous or real time data correlations between all teacher threats and student on-task behaviour are r=-0.306 for N= 17 and r=0.435, p<0.01 for N=53. Teacher threats correspond to troughs in student on-task behaviour (Figure 5.4.30) for N=17, whereas the relationship for N=53 is moderate to large and of opposite valence (Figure 5.4.31). Teacher threats (209/290/291) peak around interval 22 for both samples.

Figure 5.4.30 and Table 5.4.26 show the variability of teacher threats both within and across intervals.

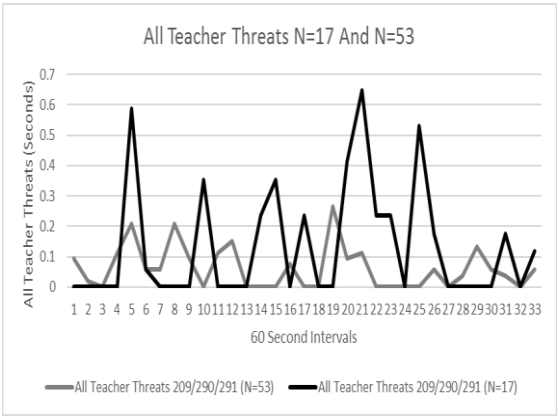


Figure 5.4.30 The Mean Rate (Seconds per Minute) of All Teacher Threats for Samples N=17 and N53

Table 5.4.26 Correlation between the Mean Rate (Seconds per Minute) of Teacher Threats and the Mean Rate (Seconds per Minute) of Student On-Task Behaviour for Samples N=17 and N=53

All Teacher Threats	**Correlation:**	**Significance:**
N=17		
mean time/minute (seconds)	0.132	
r=	-0.306	
N=53		
mean time/minute(seconds)	0.060	
r=	0.435	P < 0.01

Correlations between all teacher threats (209/290/291) and student on-task behaviour (301/302/320) for both samples (N=17 and N=53) approximated zero given lag comparison.

Table 5.4.27 The Mean Rates (Seconds per Minute) of Teacher Threats Differentiated and Combined plus Mean Rates (Seconds per Minute) of Threats Directed Toward the Whole Class and all Students as a Percentage of the Mean of all Teacher Threats

Behaviour:	Behaviour Code:	N=17		N=53	
		Seconds Per	Incidents Per	Seconds Per	Incidents Per
		Minute:	Minute:	Minute:	Minute:
teacher threatens whole class	209	0.029	0.121	0.025	0.242
teacher threatens target student	290	0.018	0.121	0.001	0.030
teacher threatens other student	291	0.086	0.303	0.037	0.485
all teacher threats	209/290/291	0.132	0.424	0.062	0.606
threats to all students	290/291	0.103	0.424	0.037	0.515
threats to whole class as % of all teacher threats	209 as % of 209/290/291	21.622		39.815	
threats to all students as % of all teacher threats	290/291 as % of 209/290/291	78.378		60.185	

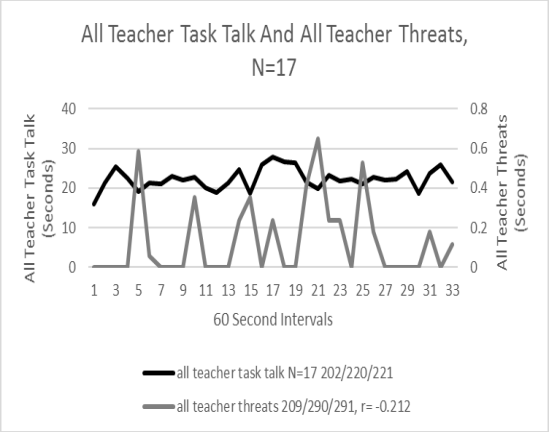
Table 5.4.27 shows teacher threats differentiated and combined and the relative percentages of teacher threats to all students and those directed toward the whole class for N=17 (78.378 and 21.622 per cent respectively) and for N=53 (60.185% and 39.815%). This differential in percentages, plus that N=17 is constituted of those teachers with expressed management difficulties would account for the difference in correlations between the samples in Table 5.4.28, where in the correlations for the respective samples are reversed.

Table 5.4.28 Correlations between the Mean Rates (Seconds per Minute) of Teacher Threats to the Whole Class and to all Students Combined and Mean Rates (Seconds per Minute) of Student On-Task Behaviour and Student Unwanted Behaviour For Samples N=17 And N=53

Correlations Of Teacher Threats To Whole Class		N=17		N=53	
And All Students Combined With Student On Task		on task	unwanted	on task	unwanted
And Unwanted Behaviour:		behaviour	behaviour	behaviour	behaviour
teacher threats to all students combined	290/291	-0.172	0.268	0.141	0.019
teacher threats to whole class	209	-0.333	0.278	**0.404**	**-0.306**

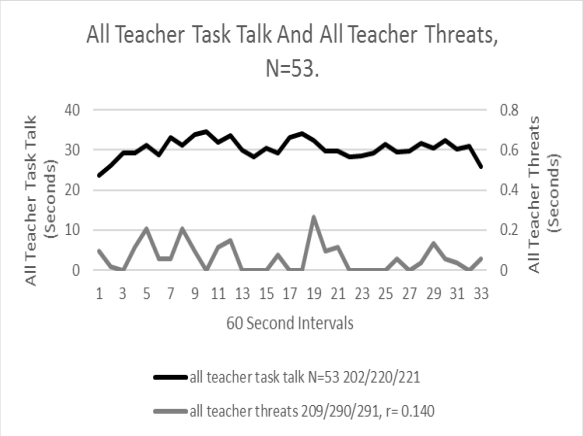
For N=53 teacher threats to the whole class related moderately ($r=0.404$, $p<0.01$) with student on-task behaviour and ($r=-0.306$, $p<0.05$) with student unwanted behaviour. For N=17 the respective correlations are $r=-0.333$ and $r=0.277$. These valences are repeated in regard to teacher threats to all students for N=17 (although not significant). This indicates teacher threats are not having the desired effect for this group N=17 overall.

In both samples, teacher threats to the whole class have increments above teacher threats directed toward individual students (Table 5.4.28).



r= -0.212

Figure 5.4.31 The Mean Rates (Seconds per Minute) of All Teacher Task Talk and all Teacher Threats Combined (N=17)



r= 0.140

Figure 5.4.32 The Mean Rates (Seconds per Minute) of All Teacher Task Talk and all Teacher Threats Combined (N=53)

Like Figure 5.4.28 in respect to student on-task behaviour, Figure 5.4.31 shows teacher threats largely corresponding with troughs in teacher task talk. This is reflected in the correlation coefficient (r=-0.212). This is not so for N=53 (r=0.140) in which threats are more embedded in a higher rate of teacher task talk.

Commentary Rates (incidents per minute) indicated that threats occurred more times per interval for N=53 than N=17, although for N=17 threats occurred more than twice the time (seconds per minute) for N=17 than N=53 (Table 5.4.27, Figures 5.4.28 and 5.4.29).

Contiguous or real time data correlations between all teacher threats and student on-task behaviour show moderate relationships (r=-0.306 for N=17 and r=0.435, $p<0.01$) for N=53. Teacher threats correspond to troughs in student on-task behaviour (Figure 5.4.28) for N=17, whereas the relationship for N=53 is moderate and of opposite valence (Figure 5.4.29). Rather than being anomalous, the relationship for N=53 may simply reflect the 'head down and working' response they generate especially when student on-task behaviour is a pervasive expectation as is the case with N=53. This supports the contention that a high level of teacher task talk is a significant contextual variable (base) upon which other behaviour gains effect.

For N=53 teacher threats to the whole class related moderately (r=0.404, p<0.01) with student on-task behaviour and (r=-0.306, p<0.05) with student unwanted behaviour, which is what would be expected. For N=17 the respective correlations are r=-0.333 and r=0.277. These valences are repeated regarding teacher threats to all students for N=17 (although not significant). This indicates teacher threats are not having the desired effect for this group N=17 overall.

Despite the lack of significant relation between threats and student on-task and unwanted behaviour overall, Figure 5.4.28 would suggest that teacher threats (intervals 19 to 24) for N=17 have had an effect in the desired direction.

Summary and Discussion

No relationships were found between teacher task talk severally or combined and student on-task behaviour for those teachers who had expressed difficulty (N=17). Moderate to large relationships and effect sizes, were found between teacher task talk to the whole class (202, r=0.600, p<0.001)) and student on-task behaviour (301/302/320) indicating a stronger relationship between these two variables than for the sum of teacher task talk with student on-task behaviour (301/302/320, r=0.382, p<0.01) for N=53. The moderate negative relationships between teacher task talk to the target student (220, r=-0.332, p<0.02) and to other students (221, r=-0.341, p<0.02) and student on-task behaviour (301/302/320) indicate that this direction of teacher task talk does not add incrementally to overall student on-task behaviour. This probably reflects a distraction effect for both.

The above results indicate that teacher task talk combined (202/220/221), and particularly teacher task talk to the whole class (202), are more related to student on-task behaviour than is an individual focus (220). The latter relationships (220 and 221), representing an individual focus are detracting of student on-task behaviour. These results replicate those found in Sections 5.1 to 5.3.

For sample N=53, moderate to large negative relationships were found between teacher task talk to the whole class (202, r=-0.544, p<0.001) and all teacher task talk (202/220/221, r=-0.374, p<0.01) with student unwanted behaviour. These

results indicate that a high rate (moderate to large relationship) of teacher task talk (greater than 50% of available time in this case) relates to both student on-task behaviour and student unwanted or competing behaviour (Table 5.4.4). Conversely, that a rate of teacher task talk constituting 37% of available time (N=17) is associated with a loss of those relationships.

No relationships were found in sample N =17 between teacher task talk (202/220/221) and student unwanted or competing behaviour (330/305/306/307/308/340/350/360)). Student unwanted or competing behaviour is considerably more variable and of greater rate and is more protracted across intervals than N=53.

Hypothesis, H_1, that there is a significant positive relationship between the rate of teacher task talk and student on-task behaviour in classroom settings can be are strongly supported by the above results.

Hypothesis, H_2, that there is a significant negative relationship between the rate of teacher task talk and student unwanted or competing student behaviour in classroom settings are strongly supported by the above results.

Hypothesis, H_3, that there are significant relationships between rates of teacher task talk, teacher reprimands and behaviour talk and student unwanted or competing behaviour, and student on-task behaviour in classroom settings, is strongly supported by the results.

Hypothesis H_4, that there are significant positive relationships between rates of teacher task talk, teacher praise for work and student on-task behaviour in classroom settings, is not supported by the data.

Reciprocal Teacher–Student Task Talk

The respective relationships found for reciprocal teacher–student task talk indicate moderate to large association or congruity between teacher–student and student–teacher task talk for N=17 and N=53 ($r=0.330$ and $r=0.579$, $p<0.001$, respectively).

These results (relative rates and congruence) suggest a greater teacher responsiveness and control over the interactions for N=53 than N=17. That is with a higher rate of teacher task talk to the whole class and combined.

Teacher task talk to the target student related r=0.046 with student on-task behaviour for N=17 and r=-0.332, p<0.02 for n=53. Relationships with student unwanted or competing behaviour were r=-0.004 for N=17 and r= 0.142 for N=53. Neither result indicate reciprocal task talk to contribute significantly to overall student on-task behaviour or student unwanted behaviour.

In the current study, reciprocal teacher–student task talk can be seen as reflecting 'opportunities (for the student) to respond' which by this assessment do not add positively, indeed it detracts from student on-task behaviour.

These results are not consistent with those reported in the literature showing that providing opportunities to respond academically increased student on-task behaviour and decreased disruptive behaviour (Carnine, 1976; West & Sloane, 1986; Skinner & Shapiro 1989). The differences probably reflect sampling differences, time sampling compared with a continuous seconds per minute record, and interval size – in the current study the interval size incorporates a greater time record - and the inclusion of attending to teacher as on-task behaviour is less likely to be reflected in the on-task behaviour measure.

Teacher Praise

For the sample N=17 the only relationships approximating significance were between teacher praise for work to the whole class (205) and student on-task behaviour (301/302/320, r=-0.465, p<0.10), and teacher praise to the target student for behaviour (r=0.309) and student on-task behaviour (301/302/320). These do not fall within the 95% confidence level adopted.

For sample N=53 teacher praise to the target student for work related, a moderate to large relationship (r=-0.418, p<0.01), with student on-task behaviour. A small to moderate relationship and effect size was found between all teacher praise for behaviour, r=0.293, p<0.05, and student on-task behaviour.

For both N=17 and N=53 relationships between teacher praise to the target student for work (250) were of negative valence.

No relationships were found between all teacher praise for work (205/250/251) and student on-task behaviour (301/302/320) for either sample.

No relationships were found between all teacher praise for work and behaviour combined (205/250/251/206/260/261) and student on-task behaviour (301/302/320) for either sample. A one interval lag on all teacher praise (205/250/251/206/260/261) and subsequent correlation with student on-task behaviour (301/302/320) indicated coefficients of r=0.070 for N=17 and r=-0.055 for N=53, neither of which are significant. This juxtaposition (cross correlation) indicated that teacher praise for work and behaviour combined did not relate with student on-task behaviour when praise is viewed as a subsequent event.

In the literature, teacher praise has been shown to be correlated with student on-task behaviour (Apter, Arnold & Swinson, 2010) with increasing academic performance and decreasing problem behaviour (Gable, Hester, Rock & Hughes, 2009). Inherently, praise immediately constitutes a distraction from task and can only be seen as increasing it given the inclusion of attending to teacher as on-task behaviour. In the current study, introducing lag analysis circumvented this issue by looking at on-task behaviour over a longer time frame.

The negative correlation obtained between teacher praise for work for N=53 and the negative valences of juxtaposed relationships to reflect praise as a subsequent event, that praise for work offers increments to student on-task behaviour is questionable on the basis of this data.

Teacher Proximity

No relationships were found between teacher proximity to the target student (201) and any teacher behaviour directed to the target student for either N=53 or N=17. Student repetitive movements related negatively with teacher proximity ($r=-0.303$, $p< 0.05$), this reflecting a moderate relationship between variables. The same relationship for N=17 was more elevated than any other (r=0.360). The lack of relationship is surprising given the rate (seconds per minute) of teacher proximity

to the target student, although it may be that the function of teacher proximity is something that is not being measured in the current study, such as maintaining public visibility, maintaining oversight of student work without further participation, or retaining a focal non-contingent presence, or awareness that interruption disrupts application to task. The elevated rates of teacher proximity are indicative of teacher mobility in the classroom.

Gunter, Shores, Jack, Rasmussen and Flowers, (1995) described teacher proximity as enhancing the effectiveness of all teacher-student interaction. The results in the current study do not indicate teacher proximity is employed as a specific management strategy in this way.

Teacher Social Talk

All teacher social talk combined (204/240/241), to the class, to the target student and to other students summed was greater for sample N=53 (1.187 seconds per minute) than N=17 (0.822 seconds per minute) and dispersed over all intervals. This is surprising as teacher social talk can be seen as the proactive pursuit of competing behaviour. Perhaps this reflects the pursuit of 'grander' goals (than student on-task behaviour) such as improved teacher–student relationships.

Reciprocal teacher–student social talk related r=0.195 for sample N=17 and r=0.402, $p<0.01$ for N=53. The results indicate a considerably greater congruity and responsiveness of both teacher and student for sample N=53.

N=17 is characterised by protracted reciprocal teacher–student social talk at the beginning of class (seven minutes duration) and what could be described as perseverative social talk to the teacher by the target student in the absence of reciprocal teacher–student social talk. The 'burst' over the last eight minutes of class appears an artefact of teacher reciprocation over that period. This is reflected in the lack of relationship between the two (r=0.195). For N=53 (Figure 5.4.16), a more reciprocal and controlled scenario (r=0.402, $p<0.01$) is evident albeit there is an indication of student perseverative behaviour at the beginning of class.

The protracted reciprocal teacher–student social talk at the beginning of class for N=17 indicates that engaging in social talk at the outset of class is

characteristic for a number of classes, and was associated with continuing student social talk independent of teacher reciprocation. This was more pronounced in those classes in which teachers described having management difficulty.

For N=53, a large relationship and effect size were found between teacher social talk to the whole class, to other students and combined and reprimands and behaviour talk to the whole class (207/203), to other students (271/231) and all reprimands and behaviour talk (207/303/270/230/271/231) summed ($r=0.529$, $p<0.001$).

These results do not support the notion that teacher social talk can be construed as relationship building even in classes with a high relative rate of teacher task talk and lower rates of student unwanted or competing behaviour (N=53).

No relationships were found for sample N=17.

No relationships were found with student social talk to other students (330), student on-task behaviour and student unwanted or competing behaviour indicating no generalised effects on those behaviours.

The perseverative nature of student social talk to the teacher for N=17, in the absence of teacher reciprocation, and the relationship of reprimand and behaviour talk with teacher-student social talk for N=53 indicate this cannot be viewed as contributing positively to teacher–student relationships.

Whilst students may view the relationships they have with their teachers as a major influence on their educational achievement (Bishop et al, 2003), teacher social talk within class cannot be seen as contributing positively to this relationship.

Reprimands

The dispersion of behaviour across intervals is equivalent for both samples.

The sample N=17 is 4.75 times more reprimand (207/270/271) 'rich' (seconds per minute) than sample N=53. The sum of teacher reprimands and behaviour talk (207/203/270/230/271/231) has occurred 2.87 times more in sample N=17 and unwanted behaviour (330/303/304/3305/306/307/340/350/360). has

occurred 2.95 times more There was greater variability apparent in respect to teacher reprimands and behaviour talk (203/230/231/207/270/271) for sample N=17 relative to N=53.

The summation of teacher reprimands and behaviour talk (203/230/231) is constituted of 53.19% reprimands (207/270/271) for sample N=17 and 32.12% for N=53, the complement being behaviour talk (203/230/231). Maximal relationship for N=17 between all teacher reprimands (207/270/271) being with a two interval lag on reprimands ($r=0.289$), for N= 53 the maximum relationship was with the real time recording ($r=0.432$, $p<0.01$).

This data shows the protracted nature of reprimand and behaviour talk severally with N=17 relative to N=53. The relationship found between all teacher reprimand and all teacher behaviour talk for N=53 being the real time recording, indicates behaviour talk to be an integral part of reprimand. A one interval lag and the relationship is not significant. For N=17, the maintenance of elevated relationships indicates the protracted nature of both reprimand and behaviour talk.

For N=17 student unwanted or competing behaviour (330/304/305/306/307/308/340/350/360), 86.35% of this is constituted of target student social talk to other students (330), in N=53 this is 89.14% This indicates N=17 has a greater percentage of more extreme behaviour than N=53.

No relationships were found between teacher reprimands and behaviour talk, and student unwanted or competing behaviour ($r=0.027$ and $r=0.078$, respectively) when compared contiguously. On the face of it this would indicate that reprimand and behaviour talk was not related to the behaviour that it was presumed to reduce.

With a two interval lag on reprimands for sample N=17 the relationship between reprimands and behaviour talk and student unwanted or competing behaviour is $r=0.567$, $p<0.01$. For sample N=53 the relationship is $r=0.401$, $p<0.01$. There is greater duration of reprimand and behaviour talk and variability in the sample of those teachers expressing management difficulty (N=17) than those not doing so (N=53). This may reflect a tendency by teachers in N=17 to ‘follow’ the

unwanted or competing behaviour with reprimands and behaviour talk, both being of greater duration (seconds per minute) both within and across intervals. This is consistent with the relationships found between all teacher reprimand and all teacher behaviour talk.

Lagging N=17 by one interval (60 seconds) realised a correlation coefficient of r=0.36. Lagging N=53 by two intervals (120 seconds) realised a correlation coefficient of r=0.03 (Table 5.4.19). The one and two interval lags adopted, for N=53 and N=17 respectively, are optimal for the respective data sets in respect to maximum congruence.

This analysis resulted in respective significant correlations of r=0.567, $p<0.01$ (N=17) and r=0.401, $p<0.01$ (N=53), that is, large relationships and effect sizes. For those teachers not expressing difficulty with teaching, there was an initial high (5 seconds) level of teacher reprimand and behaviour talk corresponding with the initial equivalent duration per minute of unwanted or competing behaviour, both of which reduced equivalently. This initial 'burst' of reprimand is also apparent for sample N=17, and was probably necessitated by student-student and teacher-student social talk at the outset of class.

For N=53, there was an increase in unwanted or competing behaviour after interval 22. Truncating the data for the sample N=53 to 22 intervals realised a correlation coefficient of r=0.797, $p<0.001$ between teacher reprimands and behaviour talk and student unwanted or competing behaviour.

This data indicates that a high correspondence between teacher reprimands and behaviour talk and student unwanted or competing behaviour for the first 22 minutes of class time whilst maintaining teacher task talk at a high level (greater than 50% of time) contains student unwanted behaviour sufficiently for student on-task behaviour to persist at a high level over time.

For N=53 (Table 5.4.24, Figure 5.4.25) a one interval lag on reprimand and behaviour talk realised a correlation of r= 0.401, $p< 0.01$ between teacher reprimand and behaviour talk and student unwanted behaviour. The correlation with student on-task behaviour indicated no relationship. Given a two interval lag the correlation

with student unwanted behaviour was r=-0.353, p<0.02, with student on-task behaviour r=0.481, p< 0.001. With a three interval lag the respective correlations were r=-0.158 and r=0.336, p<0.02. These results indicate that teacher reprimand and behaviour talk had a significant suppressing effect on student unwanted behaviour and positive effect on student on-task behaviour within a two interval time frame.

Considering these results alongside those presented in Table 5.4.18, reprimands and behaviour talk may simply gain their effectiveness at suppressing unwanted behaviour and increasing on-task behaviour due to the greater levels (rates of greater than 50% of available time) of teacher task talk within and across intervals. That inherently this may limit any ongoing negative effects associated with protracted reprimand and re-orientate students to an on-task focus.

Conversely, that low levels (rates of 37% of available time) of teacher task talk within and across intervals results in a loss of significant relationships between teacher task talk and student on-task and unwanted or competing behaviour. Further, that this results in greater variability across all other teacher–student behaviour, and particularly in lower rates of student on-task behaviour and greater rates of unwanted or competing behaviour.

Reprimands mainly resulted in the immediate reduction in unwanted behaviour, albeit temporarily.

Correlations were all higher for teacher verbal behaviour directed toward the whole class compared to all targets combined and more so than to the individual student.

Teacher Threats

Contiguous or real time relationships between all teacher threats and student on-task behaviour are r=-0.306 for N= 17 and r 0.435, p<0.01 for N=53. Teacher threats correspond to troughs in student on-task behaviour for N=17, whereas the relationship for N=53 is significantly in the opposite direction. Rather than being anomalous, the relationship found for N=53 may simply reflect the ‘head down and working’ response they generate. This supports the contention that high rates of

teacher task talk are a significant contextual variable (base) upon which other behaviour gains effect. Unlike teacher reprimands and behaviour talk, lagging the data reduced the correlation coefficient.

Interestingly, teacher threats (209/290/291) peak around intervals 22 for both samples.

For N=53 teacher threats to the whole class related $r=0.404$, $p<0.01$ with student on-task behaviour and $r=-0.306$, $p<0.05$ (medium to large effect sizes) with student unwanted behaviour, which is what would be expected. For N=17 the respective correlations are $r=-0.333$ and $r=0.277$. These valences are repeated in regard to teacher threats to all students for N=17. This indicates teacher threats are not having the desired effect for this group N=17.

In both samples, teacher threats to the whole class have increments above teacher behaviour directed toward individual students.

Consistently, teacher verbal behaviour directed to the target student has been found not to relate to student on-task or student unwanted behaviour. The predominant relationships with student on-task and unwanted behaviour are with teacher task talk to the whole class (202) and all teacher task talk combined (202/220/221).

Teacher-student reciprocal task talk did not add incrementally to the maintenance of student on-task behaviour.

Teacher reprimands and behaviour talk were found to relate to student unwanted behaviour given a one interval lag, indicating congruence with unwanted behaviour (reprimand and behaviour talk being subsequent events) for sample N=53. An additional lag evidenced a positive relationship with student on-task behaviour and negative relationship with student unwanted behaviour. This showed reprimand and behaviour talk to be an effective intervention given the maintenance of a high level of teacher task talk (greater than 50% of available time).

It is considered that maintaining a high rate of teacher task talk that is public in nature (202, 202/220/221) ‘depersonalises’ or removes teacher (and class)

attention (reprimand and behaviour talk) from the targeted student and makes it more congruent with established research-based principles for effective punishment. That is, it makes it time limited. For sample N=53, for the first 22 minutes (intervals) of class, immediacy of punishment was high, contingency as evidenced by congruence or contiguity with a one interval lag was high, it was limited in time, the schedule was continuous and demand characteristics for alternative on-task behaviour continuous (Lerman and Vorndran, 2002; Spradlin, 2002) and were well-established beforehand (MacMillan et al., 1973). This 'magical' number, 22 minutes, does not appear to relate to class length. For example, it does not constitute greater than 50% of class time – length of class varied between 34 minutes and 90 minutes – although it may relate to class length and topic or activity changes within the longer classes. This requires further analysis.

> Planned socially mediated punishment is implemented frequently by untrained individuals. Parents, teachers, and judges, among others, implement punishment—or at least what they believe to be punishment—for the expressed purpose of decreasing problematic behaviour. These individuals cannot possibly know or understand the optimal conditions under which their procedures would be effective (no one does). (Vollmer, 2002, p.470).

Given the described relationships or parameters regarding teacher task talk and student on-task and unwanted behaviour found in the current study, the need to understand the research-based principles for effective punishment, the ability to continually discriminate sufficiently and apply differentiated interventions contingently and consistently become unnecessary – the imperative becomes increasing the rate (seconds per minute) of task talk. Maintaining ongoing task talk is a considerably simpler and more practicable proposition in the classroom, or any setting than selective attention or planned ignoring and is well within the repertoires of teachers (and parents) without especial training.

For sample N=17, with considerably less teacher task talk (37% of available time), all behaviour measured was considerably more variable and the relationships between teacher task talk and teacher reprimand and behaviour talk were lost.

Neither teacher praise nor social talk were found to relate positively to student on-task behaviour. Teacher proximity to the target student did not relate with any teacher verbal behaviour directed to the target student for either sample.

The large relationships found between teacher task talk to the whole class and combined and student on-task and unwanted behaviour (cf. teacher verbal behaviour directed to a target student alone) indicate a commonness of student behaviour (a tendency to behave in concert) that is not sensitive to change via teacher change in individual behaviour-subsequent event relations. This explains why 'infection' of unwanted behaviour within the classroom is readily effected.

The above results offer practical and readily practicable strategy for classroom teaching practice.

5.5 One Student (3007) and Two Teachers (2004 And 2005)

Introduction

Carr et al. (1991) and Taylor and Carr (1992b) found escape behaviour reduced task demands, attention-seeking behaviour increased adult attention, and "socially avoidant problem behavior decreased adult attention." (p. 73). Gunter and associates (1993 & 1994) described teacher interactions with problem children as constituting a 'cycle of negative reinforcement,' wherein a response or behaviour is strengthened by stopping, removing or avoiding a negative outcome or aversive stimulus, and that this 'cycle' related equally to both teacher and student avoidance of issuing and avoiding task demands.

The reported lack of approval for social behaviour in the literature and in their own studies led Shores, Jack, Gunter, Ellis, DeBriere and Wehby (1993) to

suggest that student "compliance (generally) may have been under the control of negative reinforcement contingencies." (p.27). That is, students mostly comply to avoid teacher disapproval or other negative consequences.

Previous analysis of classroom behaviour (all data combined, N=72, Section 5.3) has shown a strong positive relationship between teacher task talk to the whole class and student on-task behaviour ($r=0.703$, $p<0.001$) and correspondingly with student unwanted or competing behaviour ($r=-0.572$, $p<0.001$). Teacher task talk combined (to the class, to the target student and to other students) correlated positively with student on-task behaviour and negatively with unwanted or competing behaviour ($r=0.454$, $p<0.001$ and $r=-0.499$, $p<0.001$ respectively). When the data was differentiated on the basis of teachers having expressed management difficulty (N=17) and those not (N=53, Section 5.5) all teacher task talk greater than 30 seconds per minute was associated with higher rates of student on-task behaviour (49.030 seconds per minute, $r=0.600$, $p<0.001$) and lower rates of unwanted or competing behaviour (2.363 seconds per minute, $r=-0.544$, $p<0.001$) than when teacher task talk was below 23 seconds per minute for sample N=17 (student on-task behaviour 36.241 seconds per minute, unwanted or competing behaviour 6.975 seconds per minute). When reprimands and behaviour talk were juxtaposed to reflect the consequential nature of such contingent behaviour and truncated in accord with teachers actively controlling unwanted behaviour, a close relationship for teachers not expressing difficulty (sample N=53) was found ($r=0.797$, $p<0.001$). This reflected the congruence of reprimands and behaviour talk with unwanted or competing behaviour. Significant relationships were not found for sample N=17 (teachers 'having trouble') for any of the above with teacher task talk indicating that at this lower level of teacher task talk these relationships were lost. Variability and the protracted nature of reprimand and behaviour talk was also found to be characteristic of those teachers who had expressed management difficulty.

Data from the larger study permitted the analysis of one student with two different teachers. Teacher 2004 was experiencing extreme difficulty managing the student and the class (abuse, profanities, physical intimidation, work refusal, actively inciting other students into similar refusal, denigration, and laughing at her

frustration). Frequently the student's behaviour was destructive of the learning of all and was infecting many student relationships with the teacher and each other.

This was not the case for teacher 2005.

In the current analysis, the teachers' overall task talk to the class were very similar, 23 seconds per minute for teacher 2004, 23.8 seconds for teacher 2005 (Table 5.5.1). Both levels are consistent with the described previous analyses indicating student unwanted or competing behaviour would be considerable.

From the literature, it would be expected that effective management would involve greater application of known behavioural principles in respect to attention for work and praise for student on-task or wanted behaviour, and reprimand, 'planned ignoring' (selective attention) for student unwanted behaviour (Sherrill et al, 1996; Lerman and Vorndran, 2002; Sutherland et al, 2008). It was expected that these strategies would be proactively pursued and that there would be obvious indication of contiguous and contingent association between teacher–student behaviour. From Sections 5.1 to 5.4 in the current study, it would be hypothesised that a whole teacher class task talk focus and not individual student focus would be more effective at retaining student on-task behaviour and limiting unwanted behaviour. That an individual teacher focus would be deleterious in respect to maintaining student on-task behaviour and reducing unwanted behaviour.

Method

Subjects The first teacher (2004) was female, the second teacher (2005) was male. The student 3007 was male. Both teachers were very experienced, teacher 2004 having 21 years in teaching, teacher 2005 28 years.

Both teachers saw the student as 'challenging,' teacher 2004 having considerable difficulty in his management. The research was focused on observing and describing teacher practice during normal classroom interactions and tasks and student responses to these.

Setting The setting was a general education classroom in year 8, the class was a composite class (year levels 5 to 8) and comprised 20 students with teacher 2004, 21 students with teacher 2005. The school was decile 2.

Procedure The procedure followed involved videoing classrooms during normal teacher instruction (Section 2.3). Behaviour observation codes are described in Section 2.7, inter-observer agreement in Section 2.9 and Section 4.1 of the Results Section.

Data Collection The data relating to teacher praise, reprimands, behaviour talk, task talk, social talk, teacher proximity (the independent variable) and student on-task behaviour and unwanted behaviour (the dependent variable) were recorded. Dependent and independent variables were measured by a principal observer from videotaped recordings of classroom behaviour on a continuous basis. Continual recordings were combined within 60 second intervals. Inter-observer agreement was calculated from a secondary observer recording from the same video clip as the primary observer. Agreement was calculated by dividing agreements by agreements plus disagreements and multiplying by 100 for each behaviour for each reliability session.

Mean occurrence agreement was 97.71% for teacher 2004 and 94.62% for teacher 2005.

Data Analysis Rates (incidents per minute) and duration (seconds per minute) of teacher praise, reprimands, behaviour talk, task talk, social talk, teacher proximity (the independent variable) and student on-task behaviour and unwanted behaviour (the dependent variable) were recorded as a means of deducing differences between teachers' verbal behaviour toward the target student and subsequent relations on the student's on-task and unwanted behaviour. Results were recorded graphically to further illustrate temporal relations. Comparative data was analysed alongside relevant correlation tables (matrices). Teacher verbal behaviour was correlated with on-task behaviour and unwanted or competing behaviour (all correlations are two-tailed tests).

The direction of teacher and student behaviour are measured, for example, teacher task talk to the target student, to other students and to the whole class. The direction of student behaviour is toward the teacher or other students.

Results

Differences Between Teachers

Table 5.5.1 provides a summary of differences between teachers 2005 and 2006 behaviour, seconds per minute and dispersion of behaviour across intervals.

Table 5.5.1 Student On-Task Behaviour and Teacher Behaviour Differentiated and Combined for Teachers 2004 and 2005

Teacher And Student (3007) Behaviour:	Behaviour Code:	Teacher:		Teacher:	
		2004		2005	
		time/min	incidents/min	time/min	incidents/min
teacher proximity	201	5.720	0.258	5.456	0.211
student on task	301/302/320	26.226	0.731	45.078	0.878
teacher task talk to class	202	10.860	0.871	8.111	0.589
teacher task talk to target student	220	1.774	0.269	0.656	0.144
teacher task talk to other student	221	10.366	0.882	15.078	0.867
teacher task talk	202/220/221	23.000	1.000	23.844	0.900
teacher behaviour talk to target student	230	1.011	0.237	0.067	0.033
teacher behaviour talk to other student	231	1.495	0.419	0.589	0.278
teacher behaviour talk	203/230/231	3.237	0.570	1.644	0.344
teacher social talk to class	204	0.000	0.000	0.044	0.011
teacher social talk to target student	240	0.032	0.011	0.000	0.000
teacher social talk to other student	241	0.000	0.000	0.367	0.089
teacher social talk	204/240/241	0.032	0.011	0.411	0.089
teacher reprimands the target student	270	0.430	0.172	0.022	0.011
teacher reprimands other student	271	1.720	0.591	0.300	0.178
teacher reprimand and behaviour talk to target student	270/230	1.441	0.301	0.089	0.044
teacher praises target student for work	250	0.065	0.065	0.033	0.033
teacher praise target student behaviour	260	0.022	0.022	0.011	0.011
student unwanted behaviour	330/305/6/7/8/340/350/360	2.430	0.462	2.378	0.322
all teacher praise	205/50/51/206/60/61	0.495	0.333	1.211	0.422
sum reprimand and behaviour talk, orders and threats	203/30/31/07/70/71/09/90/91/08/80/81	6.000	0.892	1.989	0.378

Teacher task talk (202/220/221) is equivalent for both teachers, 23 seconds per minute for teacher 2004, 23.844 seconds for teacher 2005. Mean incidence across intervals was equivalent (1.0 and 0.9 incidents per minute respectively).

Teacher 2004 focus on the target student was characteristically greater across all measured behaviour; task talk (220), behaviour talk (230), social talk (240), reprimands (270), praise for work (250), praise for behaviour (260) and reprimand and behaviour talk (270/230). Despite the observed and expressed loss of control experienced by teacher 2004, unwanted or competing behaviour occurred

2.430 seconds per minute for teacher 2004, for teacher 2005, 2.378 seconds per minute.

The greatest difference between classes was in target student time on-task, 26.22 seconds per minute for teacher 2004, 45.07 seconds per minute for teacher 2005.

Teacher task talk to the target student for teacher 2004 is greater than that for teacher 2005 (1.77 seconds per minute and 0.65 seconds respectively. The mean for the 19 remaining students is 0.54 and 0.79 seconds respectively). This converts to 7.69% of all teacher task talk directed toward the target student for teacher 2004, for teacher 2005 this was 2.72%. Teacher task talk directed to other students was 10.36 seconds per minute for teacher 2004, 15.07 seconds per minute for teacher 2005.

For reprimands and behaviour talk combined (270/230) directed to the target student, for teacher 2004 it was 24%, for teacher 2005 it was 4.04% of all teacher reprimands, behaviour talk, orders and threats. Teacher talk directed to the target student for teacher 2004 was 3.29 seconds per minute for teacher 2005 it was 0.77 seconds. Teacher reprimands to other students and behaviour talk to other students was and 1.72 and 1.49 seconds per minute respectively for teacher 2004 and for teacher 2005, 0.3 and 0.58 seconds.

Teacher 2004 interacted with the target student more in respect to work focus (more than 3 times as much) and unwanted behaviour than with other students. For teacher 2005, task talk to the target student was less than for the mean for the remaining 19 students, reprimands and behaviour talk to the target student were 0.08 seconds per minute, to the other students the mean was 0.04 seconds per minute.

Teacher focus on unwanted or competing behaviour (the sum of reprimand, behaviour talk, orders and threats) for teacher 2004 constituted 25.54% of all teacher task talk and praise (6 seconds and 23.49 seconds per minute respectively), for teacher 2005 this was 0.62% (1.98 seconds and 25.05 seconds per minute respectively).

Teacher 2004 focus, both positively and negatively, was substantially more on the target student than teacher 2005 across all measured behaviour.

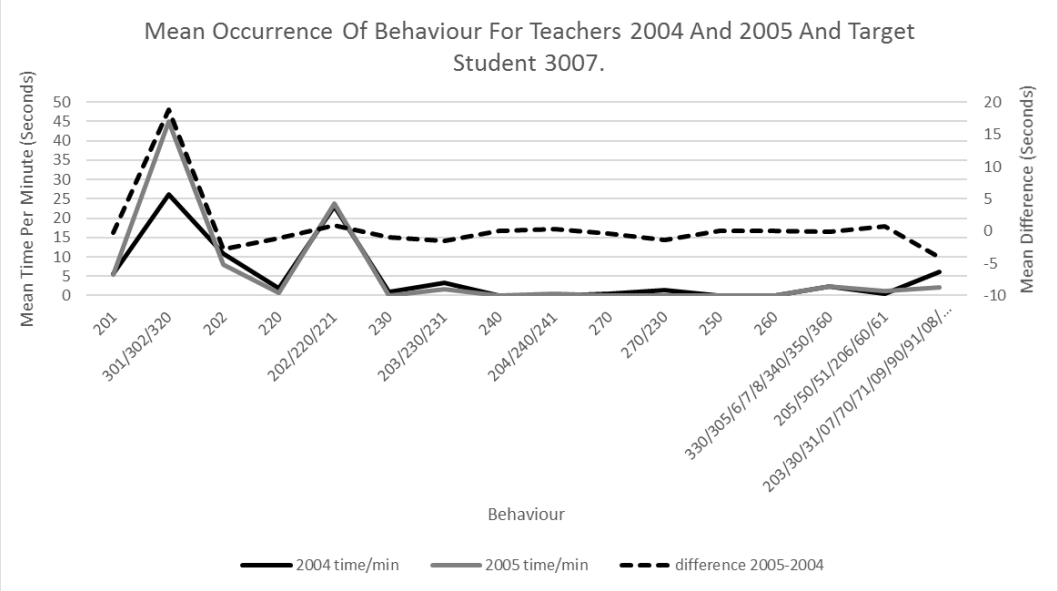


Figure 5.5.1 The Mean Difference between the Duration (Seconds) of Behaviour for Student 3007 and for Teachers 2004 and 2005

Commentary Data for both teachers (Figure 5.5.1) is largely equivalent aside from on-task behaviour (301/302/320), teacher behaviour talk (203/230/231), teacher reprimands and behaviour talk (270/230) and the sum of reprimands, behaviour talk and threats (203/230/231/207/270/271/209/290/291). Student unwanted behaviour is quite similar (330/305/306/307/308/340/350/360), 2.430 seconds per minute for teacher 2004, 2.38 seconds per minute for teacher 2005. Overall teacher task talk was very similar 23.00 seconds per minute for teacher 2004, 23.844 seconds per minute for teacher 2005. Teacher task talk differentiated was quite different. The differences in teacher behaviour largely appear to impact on student on-task behaviour.

Teacher 2004 focus on the target student was characteristically greater across all measured behaviour; task talk (220), behaviour talk (230), social talk (240), reprimands (270), praise for work (250), praise for behaviour (260) and reprimand and behaviour talk (270/230). Unwanted or competing behaviour

occurred 2.430 seconds per minute for teacher 2004, 2.378 seconds per minute, for teacher 2005.

The differences in teacher verbal behaviour largely appear to impact on student on-task behaviour.

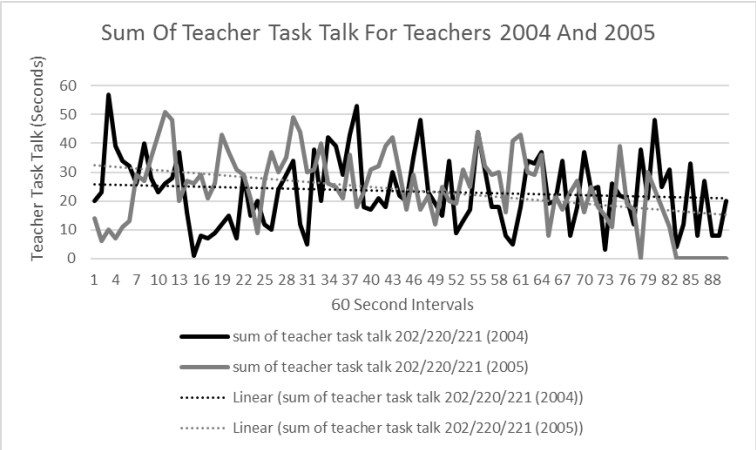
Teacher 2004 focus on the target student was characteristically greater across all measured behaviour; task talk (220), behaviour talk (230), social talk (240), reprimands (270), praise for work (250), praise for behaviour (260) and reprimand and behaviour talk (270/230).

Teacher 2005 focus was toward the whole class and lesser to the target student than others in the class. For teacher 2005, task talk to the target student was less than for the mean for the remaining 19 students.

The differences between teacher and student behaviour become more pronounced in the following figures.

Teacher task Talk

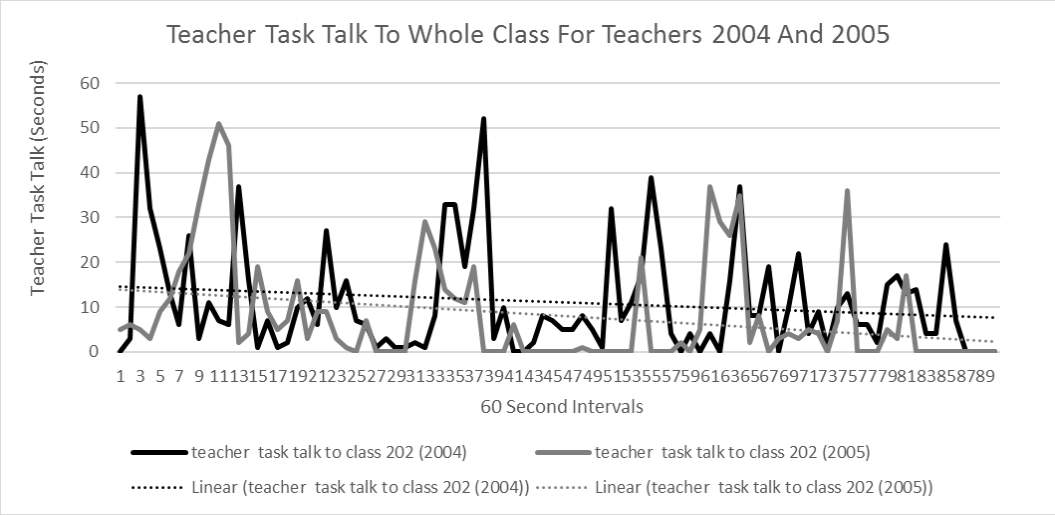
Figure 5.5.2. shows all teacher task talk for both teachers. The trend lines show the mean task talk for teacher 2004 began higher than teacher 2005 and became less after approximately half of the class time. Teacher task talk to the whole class for teacher 2005 (8.111 seconds per minute) was less than teacher 2004 (10.860 seconds per minute) for the duration of the class (Figure 5.5.3).



y (2004) = -0.0546x +25.806

y (2005) = -0.1931x + 32.629

Figure 5.5.2 All Teacher Task Talk for Teachers 2004 and 2005 with Trend Lines



y (2004) = -0.0787x + 14.696

y (2005) = -0.1315x +14.095

Figure 5.5.3 All Teacher Task Talk to the Whole Class for Teachers 2004 and 2005 with Trend Lines

Teacher task talk decreased over the course of the class for both teachers, teacher task talk to the whole class more so for both. In both examples, teacher 2005 task talk decreases at a greater rate than teacher 2004 over the duration of the class. Trend lines and equations show the rate of decline.

These differences are more visible in the cumulative duration figures (Figure 5.5.4 and Figure 5.5.5).

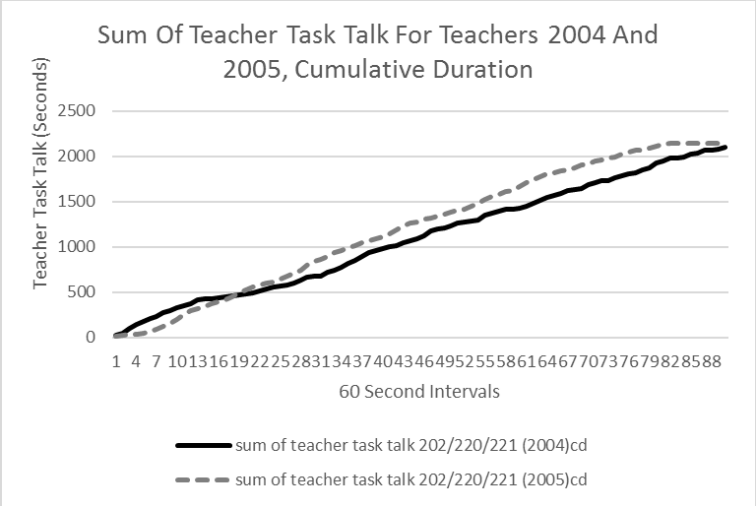


Figure 5.5.4 All Teacher Task Talk for Teachers 2004 and 2005 – Cumulative Duration

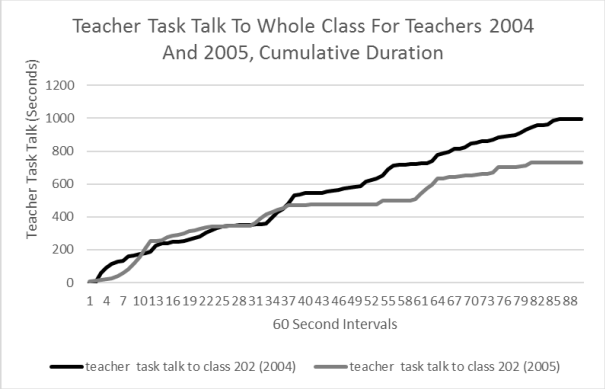


Figure 5.5.5 All Teacher Task Talk to The Whole Class for Teachers 2004 And 2005 – Cumulative Duration

As was stated above, further differentiation of teacher task talk (Table 5.5.2) indicated teacher 2004 focussed considerably more on the target student than teacher 2005 whose focus was more on other students.

Table 5.5.2 Teacher (2004 And 2005) Task Talk Differentiated with the Mean of Teacher Task Talk to Other Students

Teacher:		**2004**		**2005**	
Behaviour:	**Code:**	**time/min**	**incidents/min**	**time/min**	**incidents/min**
teacher task talk to whole class	202	10.860	0.871	8.111	0.589
teacher task talk to target student	220	1.774	0.269	0.656	0.144
teacher task talk to other students	221	10.366	0.882	15.078	0.867
mean of teacher task talk to other students		0.518	0.882	0.754	0.867
all teacher task talk	202/220/221	23.000	1.000	23.844	0.900

Teacher 2004 task talk to the target student (220) was 2.7 times greater than teacher 2005 and 3.4 times greater (seconds per minute) than the average of task talk to other students (221). For teacher 2005 task talk to the target student was less than the mean of task talk to other students. These results indicate diametrically opposed approaches to managing the target student: teacher 2004 giving additional task-based attention to that given to other students, teacher 2005 less than that given to other students. These differences are illustrated in Graphs 5.5.6 and 5.5.7.

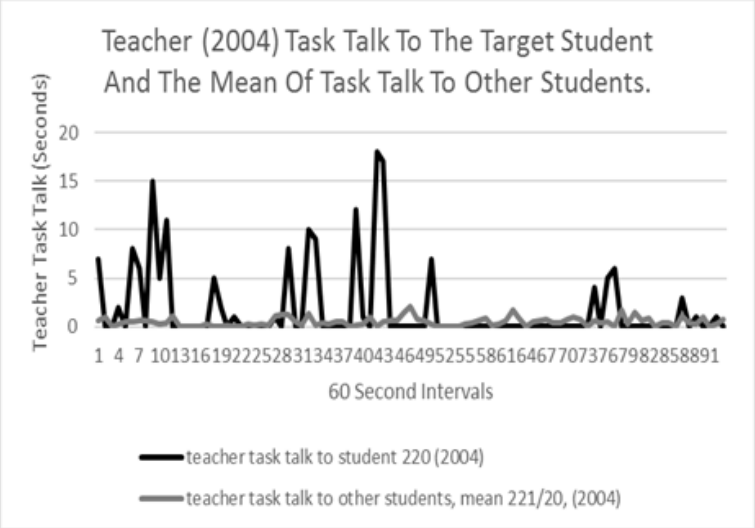


Figure 5.5.6 Teacher (2004) Task Talk to the Target Student and the Mean of Teacher Task Talk to Other Students

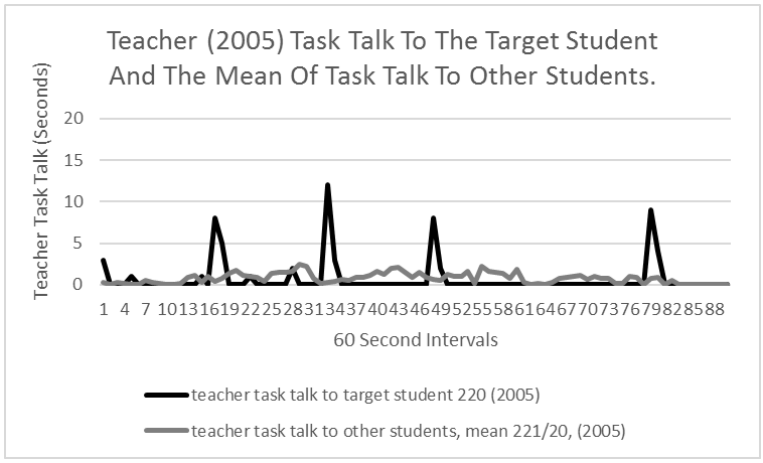


Figure 5.5.7 Teacher (2005) Task Talk to the Target Student and the Mean of Teacher Task Talk to Other Students

Teacher 2005 task talk to the target student is spaced throughout the lesson, teacher 2004 task talk occurs substantially more throughout the whole lesson

(within and across intervals) and particularly at the beginning of the lesson. Teacher 2004 has increased task-based attention with a predominant singular focus, teacher 2005 has pursued an approach of minimal task-based attention to the target student.

Table 5.5.3 The Correlation of Teacher Task Talk Differentiated and Student On-Task Behaviour for Teachers 2004 and 2005

Correlation Of Teacher Task Talk Differentiated			
And Student On Task Behaviour:		**Teacher:**	
Behaviour:	**Code:**	**2004**	**2005**
student on task behaviour	301/302/320	1.000	1.000
teacher task talk to the whole class	202	0.067	**0.550**
teacher task talk to the target student	220	0.162	0.087
teacher task talk to other students	221	-0.072	0.116
all teacher task talk	202/220/221	0.063	**0.382**

The above correlations (Table 5.5.3) for teacher 2005 between teacher task talk to the whole class ($r= 0.550$, $p< 0.001$ and all teacher task talk combined ($r=0.382$, $p< 0.001$) indicate medium to large relationship and effect size). These results are consistent with those previously described for when all the data was combined or differentiated in to teachers having difficulty and those not (Sections 5.4 and 5.5). In this instance, the correlations are not associated with high rates of teacher task talk to the whole class or overall (greater than 30 seconds per minute).

Table 5.5.4 The Correlation of Teacher Task Talk Differentiated and Student Unwanted or Competing Behaviour for Teachers 2004 And 2005

Correlation Of Teacher Task Talk Differentiated			
And Student Unwanted or Competing Behaviour:		**Teacher:**	
Behaviour:	**Code:**	**2004**	**2005**
student unwanted behaviour	330/305/6/7/8/340/350/360	1.000	1.000
teacher task talk to class	202	-0.119	-0.187
teacher task talk to student	220	**0.242**	-0.118
teacher task talk to other	221	0.120	**0.319**
sum of teacher task talk	202/220/221	0.050	0.118

Commentary Teacher task talk decreased over the course of the class for both teachers, teacher task talk to the whole class more so for both. In both examples, teacher 2005 task talk decreases at a greater rate than teacher 2004 over the duration of the class. This, plus the previous data for Intermediate Schools over the longer series (Section 5.2) indicate the classes are too long for the teacher to maintain high rates of task talk and similarly too long for the students to maintain attention.

Teacher 2004 verbal behaviour was considerably more directed to the target student than other students and more so than teacher 2005. Previous results (Sections 5.1 to 5.4) associate individually targeted teacher verbal behaviour with lower rates of on-task behaviour and higher rates of unwanted behaviour.

There were no significant relationships found between teacher task talk severally or combined and student on-task behaviour for teacher 2004. Moderate to high relationships were found between teacher task talk to the whole class ($r=0.549$, $p<0.001$) and all teacher task talk ($r=0.382$, $p< .001$) and student on-task behaviour. In this instance, the correlations are not associated with high rates of teacher task talk to the whole class or overall (greater than 30 seconds per minute), although this is unsurprising given the paucity of attention (positive and negative) to the target student relative to peers. These correlations for teacher task talk to the whole class ($r=0.549$, $p<0.001$) and all teacher task talk ($r=0.382$, $p<0.001$) and student on-task behaviour (moderate to large effects) are surprising as a majority of teacher 2005's task talk was to other students and not the whole class (15.078 and 8.111 seconds per minute respectively, Table 5.5.2), although most of this was public in nature and relatively speaking, for the target student, teacher task talk to the whole class constituted by far the greater level of teacher task talk 'to him.'

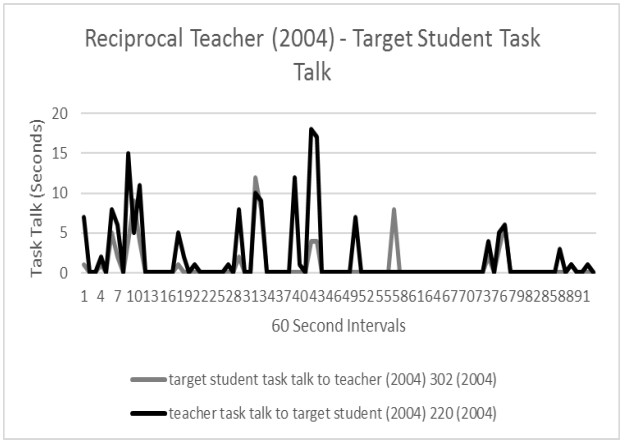
Reciprocal Teacher–Student Task Talk

Table 5.5.4 (above) shows the reciprocal nature of task talk for both teachers and the target student. Interactions were considerably more extensive for teacher 2004 in respect to incident and time (seconds per minute).

Table 5.5.5 Reciprocal Teacher-Student Task Talk for Teachers 2004 and 2005

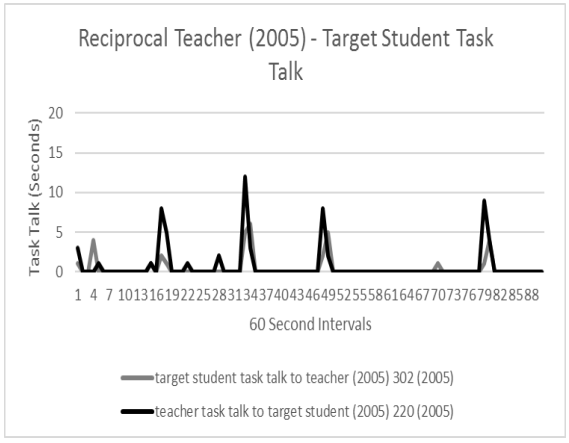
			Teacher 2004		Teacher 2005	
Reciprocal Teacher-Student Task Talk:			**time/min**	**incidents/min**	**time/min**	**incidents/min**
teacher task talk to student	220		1.774	0.269	0.656	0.144
target student task talk to teacher	302		0.828	0.194	0.367	0.133

Figures 5.5.8 and 5.5.9 show reciprocal teacher-student task talk for teachers 2004 and 2005 with the target student. Teacher 2004 placed considerable emphasis on this at the outset of class (the first 12 minutes) and again from the 28th to the 43rd minute. Teacher 2005 did so minimally throughout class.



r= 0.620

Figure 5.5.8 Reciprocal Teacher (2004) – Target Student Task Talk (Seconds per Minute)



r= 0.619

Figure 5.5.9 Reciprocal Teacher (2005) – Target Student Task Talk (Seconds per Minute)

Obtained correlations between teacher and student task talk were almost identical for both teachers (r=0.620, p<0.001 and 0.619, p<0 .001 respectively). This indicates a high level of reciprocity for both the teachers and the target student.

The ratio of teacher task talk to the target student to target student task talk to the teacher is 2.153:1 for teacher 2004 and 1.791:1 for teacher 2005. Juxtaposing teacher task talk to the target student and student on-task behaviour by one interval, resulted in low correlations between task talk and student on-task behaviour (teacher 2004, r=0.182 and teacher 2005, r=0.094). Student task talk to the teacher is included, by definition, in the total of student on-task behaviour (301/302/320).

Commentary Obtained correlations between teacher and student task talk were almost identical for both teachers (r=0.620, p<0.001 and 0.619, p<0 .001 respectively). This indicates a high level of reciprocity for both teachers and the target student (large relationship and effect size). The ratio of teacher task talk to the target student relative to student task talk to the teacher was 2.153:1 for teacher 2004 and 1.791:1 for teacher 2005. Whilst not approaching the 8:1 ratio of teacher to student talk often recommended (TIMSS-R video study,1998–2004), the ratio is considerably greater than teacher 2005.

When the data was juxtaposed to reflect student on-task behaviour subsequent to the on-task interaction relationships were insignificant (r=0.182 for teacher 2004, r=0.094 for teacher 2005). This relationship is equivalent to the

correlations gained between teacher task talk to the target student for all data combined (Section 5.3, r=-0.364, p<0.001) and when the data was differentiated in to those teachers describing management difficulty (Section 5.5, N=17) and those not (N=53). Correlations were r=0.047 for N=17 and r=-0.331 (p< 0.001) for N=53. That is, correlations were negative or neutral, when this measure of interactive behaviour could be seen as an approximation to 'opportunities to respond' which in the literature have been seen as indicative of 'good' teacher practice (Shores, Gunter et al., 1993).

These results are not consistent with the notion of teacher task talk to the target student (even with a high level of congruence between teacher–student reciprocity) adding positive increments to student on-task behaviour. This irrespective of how the data is differentiated.

Student On-task behaviour

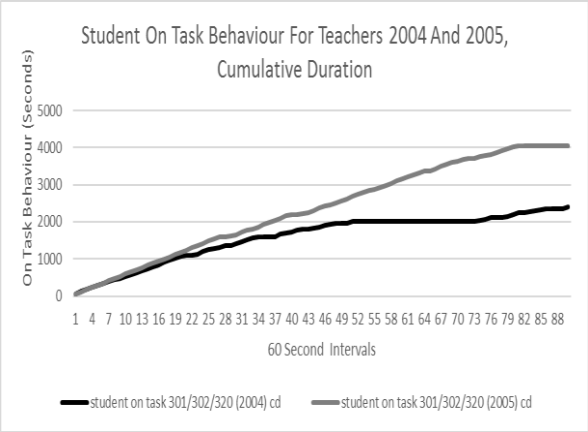


Figure 5.5.10 Student On-Task Behaviour for Teachers 2004 and 2005 with Trend Lines

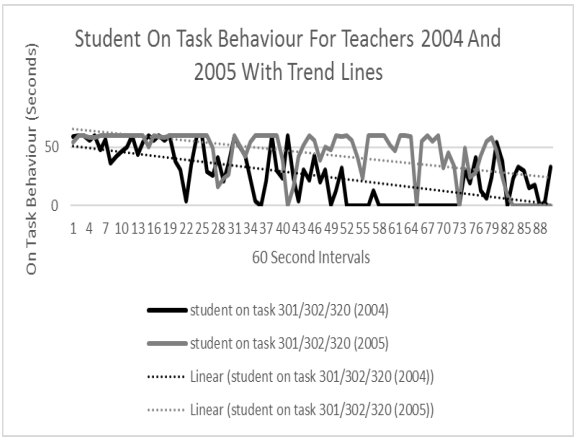


Figure 5.5.11 Student On-Task Behaviour for Teachers 2004 and 2005 Cumulative Duration

Unlike previously described data (Sections 5.1, 5.2, 5.3 and 5.4) which showed a significant relationship between teacher task talk to the whole class (202) and student on-task behaviour (310/302/320), this was not the case in this study. For teacher 2004, student on-task behaviour was 26.2 seconds per minute and incidence of 0.73 per minute. For teacher 2005 student on-task behaviour was 45.1 seconds per minute and 0.88 incidents per minute. The difference is substantial. This is depicted in Figures 5.5.12 and 5.5.13.

Student on-task behaviour decreases for both teachers over time, and more so for teacher 2004 than teacher 2005 (Figures 5.5.10 and 5.5.11). The target student was removed from the class by both teachers: for teacher 2004, this occurred between intervals 53 and 72, and for teacher 2005, interval 83. Differences in student on-task behaviour remain when target student 'out of class' is corrected for.

Teacher Praise

Table 5.5.6 Correlation of Teacher Praise for Work and Behaviour and Student On-Task Behaviour and Unwanted or Competing Behaviour

Teacher Praise For Work And Behaviour.	**Behaviour Code:**	**Correlation:**	
Correlation Of Teacher Praise For Work With:	250	**Teacher 2004**	**Teacher 2005**
student on task behaviour	301/302/320	-0.001	-0.004
student unwanted behaviour	330/305/6/7/8/340/350/360	0.074	-0.088
Correlation Of All Teacher Praise For Work With:	205/250/251		
student on task behaviour	301/302/320	-0.003	0.128
student unwanted behaviour	330/305/6/7/8/340/350/361	0.022	0.049
Correlation Of Teacher Praise For Behaviour With:	260		
student on task behaviour	301/302/320	0.143	0.046
student unwanted behaviour	330/305/6/7/8/340/350/360	-0.051	-0.050
Correlation Of All Teacher Praise For Behaviour With:	206/260/261		
student on task behaviour	301/302/320	0.191	-0.111
student unwanted behaviour	330/305/6/7/8/340/350/360	0.045	0.194

Teacher praise for work for teacher 2004 occurred 0.065 seconds per minute, for teacher 2005 this was 0.033 seconds per minute. For teacher praise for behaviour the respective times were 0.021 seconds per minute and 0.011 seconds per minute.

The relationships between teacher 2004 and 2005 praise for work and praise for behaviour were insignificant when correlated with both student on-task behaviour and student unwanted or competing behaviour. The differences between the teachers when all teacher praise was combined were teacher 2004, 0.49 seconds per minute and teacher 2005, 1.211 seconds per minute (Table 5.5.1). There was no significant relationship with student on-task or unwanted behaviour.

Both Figure 5.5.12 and Figure 5.5.13 show teacher praise to the target student for work occurring mostly during or immediately prior to a decrease in student on-task behaviour.

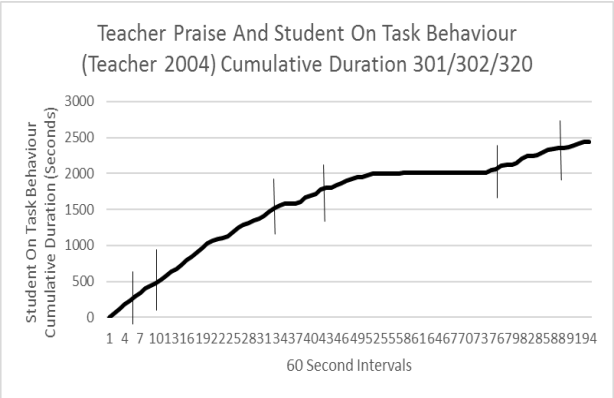


Figure 5.5.12 Teacher 2004 Praise to the Target Student for Work and Student On-Task Behaviour (Cumulative Duration of On-Task Behaviour)

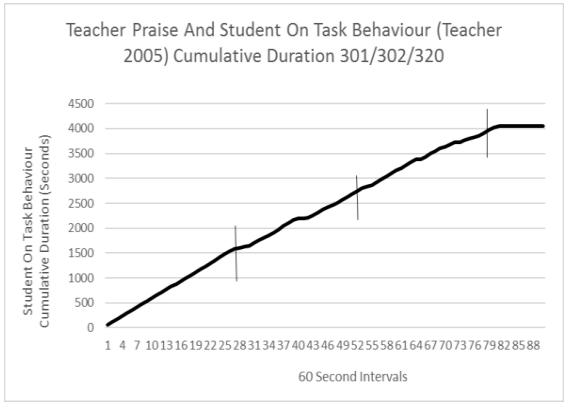


Figure 5.5.13 Teacher 2005 Praise to the Target Student for Work and Student On-Task Behaviour (Cumulative Duration of On-Task Behaviour)

Commentary Teacher praise to the target student was minimal and of infrequent occurrence for both teachers. Teacher praise for behaviour occurred less than praise for work. Figures 5.5.16 and 5.5.17 show teacher praise to the target student for work occurring mostly during or immediately prior to a decrease in student on-task behaviour.

Correlations with student on-task and unwanted behaviour were insignificant. These results are consistent with previous findings (Sections 5.1, 5.2, 5.3 and 5.4 of the current study).

Teacher Reprimands

Student unwanted or competing behaviour is shown in Figure 5.5.14, teacher reprimands and behaviour talk in Figure 5.5.15 for both teachers 2004 and 2005.

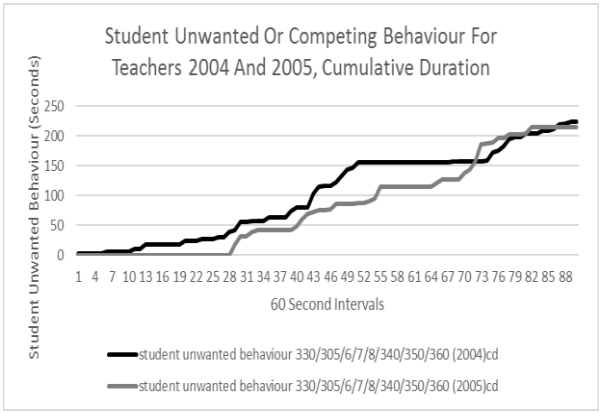


Figure 5.5.14 Student Unwanted or Competing Behaviour for Teachers 2004 - 2005, Cumulative Duration

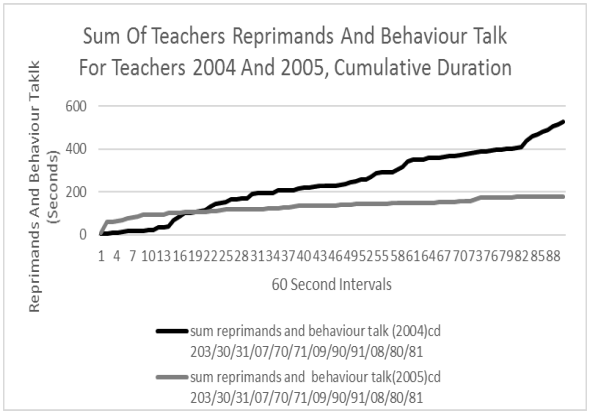


Figure 5.5.15 All Teacher Reprimands and Behaviour Talk for Teachers 2004 and 2005, Cumulative duration

Student unwanted or competing behaviour (Figure 5.5.14 and Table 5.5.6) was equivalent for both teacher 2004 and teacher 2005 (2.43 seconds per minute and 0.80 intervals and 2.37 seconds per minute and 0.32 intervals). The mean of teacher reprimands and behaviour talk for teacher 2004 was 6.00 seconds per minute and 0.89 intervals, for teacher 2005 this was 1.98 seconds per minute over 0.38 intervals. The difference in mean duration per minute and dispersion across intervals between the teachers is substantial – for the former reprimands are pervasive and evidence greater variability (Figures 5.5.14, 5.5.15 and 5.5.16).

Table 5.5.7 The Relative Time (Seconds per Minute) of Student (3007) On-Task Behaviour and Unwanted or Competing Behaviour for Teachers 2004 And 2005

Teacher:		**2004**		**2005**	
Behaviour:	**Code:**	**time/min**	**incidents/min**	**time/min**	**incidents/min**
student unwanted behaviour	330/305/6/7/8/340/350/360	2.430	0.462	2.378	0.322
student on task behaviour	301/302/320	26.226	0.731	45.078	0.878

Table 5.5.8 shows the same data but with an approximate correction for student 'out of class.'

Table 5.5.8 The Relative Time (Seconds per Minute) of Student (3007) On-Task Behaviour and Unwanted or Competing Behaviour for Teachers 2004 and 2005 with Correction for Out of Class

Teacher:		**2004**		**2005**	
Behaviour:	**Code:**	**time/min**	**incidents/min**	**time/min**	**incidents/min**
student unwanted behaviour	330/305/6/7/8/340/350/360	3.906	0.589	2.235	0.314
student on task behaviour	301/302/320	33.411	0.932	48.880	0.952

Correcting for student out of class increases target student on-task behaviour both in total and relatively between teachers as it does with unwanted or competing behaviour. It is arguable as to whether or not to continue the analysis on the complete data or with out of class data removed. The equivalence in unwanted or competing behaviour between teachers with and without out of class included (Tables 5.5.6 and 5.5.7) and completeness suggested analysis should include out of class as an integral and principal part of the data.

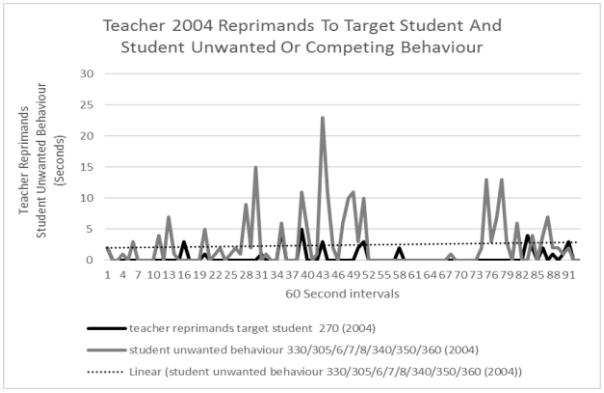
Table 5.5.9 shows teacher reprimands differentiated according to target and combined, and separated from teacher behaviour talk as was shown in Figure 5.5.15.

Table 5.5.9 The Correlation of Teacher Reprimands Differentiated, Student Unwanted and Competing Behaviour and Student On-Task Behaviour

	Behaviour Code:	**Teacher 2004**	**Teacher 2005**
Correlation Of Teacher Reprimands Differentiated With			
Student Unwanted Or Competing Behaviour And	**330/305/6/7/8/340/350/360**		
Student On Task Behaviour:	**301/302/320**		
teacher reprimands whole class	207	-0.129	-0.071
teacher reprimands target student	270	**0.311**	-0.008
teacher reprimands other students	271	-0.011	0.149
the sum of teacher reprimands	207/270/271	0.021	0.119
with student on task behaviour	207/270/271 with 301/302/320	-0.147	0.078

For teacher 2004, teacher reprimands to the target student correlated positively with student unwanted or competing behaviour ($r=0.311$, $p<0.001$). For teacher 2005 relationships were negligible. The sum of teacher reprimands correlated significantly neither with on-task behaviour or unwanted behaviour for both teachers.

Figures 5.5.16 and 5.5.17 show teacher reprimands to the target student with student unwanted or competing behaviour. Correlations between the two variables contiguously and with a one and two interval lag to reflect the consequential nature of reprimands are displayed beneath the figures.

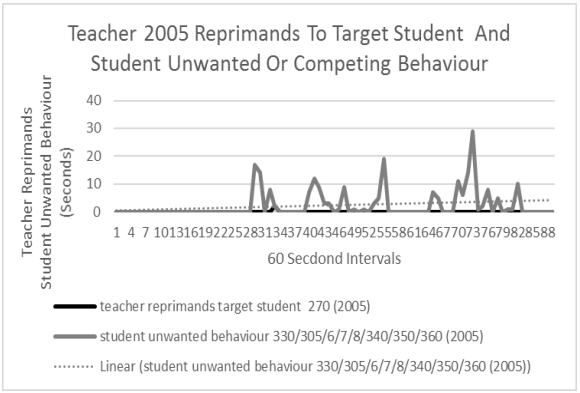


r= 0.311

With a one interval lag: r= -0.078

With a two-interval lag: r= -0.018

Figure 5.5.16 Teacher 2004 Reprimands to the Target Student and Student Unwanted or Competing Behaviour

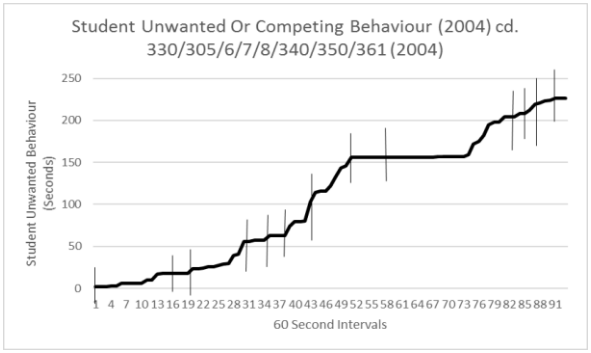


r= -0.006

With a one interval lag: r= -0.012

With a two-interval lag: r= -0.081

Figure 5.5.17 Teacher 2005 Reprimands to the Target Student and Student Unwanted or Competing Behaviour



Point:	1	16	20	31	35	39	43	51	58	83	86	88	91					33
Value:	2	3	1	1	5	5	3	3	2	4	2	1	3					2

Figure 5.5.18 Student Unwanted or Competing Behaviour (Cumulative Duration) and Teacher 2004 Reprimands to the Target Student

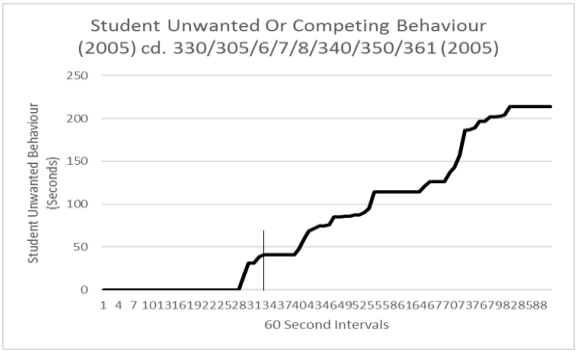


Figure 5.5.19 Student Unwanted or Competing Behaviour (Cumulative Duration) and Teacher 2005 Reprimands to the Target Student

Student unwanted or competing behaviour increases over time, more so for teacher 2005.Figure 5.5.18 shows teacher 2004 reprimands in the earlier stages of class being succeeded by a reduction in unwanted or competing behaviour – latterly this is associated with an increase. For teacher 2005 (Figure 5.5.19), the target student is reprimanded only once by the teacher and this is succeeded by seven minutes of no further unwanted or competing behaviour**.** These figures, as do the relative durations of the reprimands, reflect the relative difficulties teacher 2004

was having with this student – and the approach adopted by teacher 2005 which was minimal attention of any sort.

Table 5.5.10 Correlation of Teacher Reprimand of the Target Student (270), Student On-Task Behaviour and Student Unwanted or Competing Behaviour with Lags on Teacher Reprimands, Teacher 2004

Teacher 2004	one interval lag on unwanted behaviour	real time recording	one interval lag on reprimands	two interval lag on reprimands	three interval lag on reprimands	four interval lag on reprimands	five interval lag on reprimands
	-1	0	-1	-2	-3	-4	-5
correlation reprimand and unwanted behaviour	0.037	**0.311**	-0.078	0.018	0.054	0.067	0.051
correlation reprimand and on task behaviour	-0.030	-0.030	0.021	0.017	0.030	0.193	0.053

Table 5.5.10 shows the juxtaposition of the independent variable (teacher reprimand) to the target student by discrete intervals (lags 1-5) and correlations to reflect the association between student unwanted behaviour and on-task behaviour over time. A significant relationship at Point -1 would indicate a large relationship between reprimand and unwanted behaviour.

Subsequent correlations would be expected to show high positive relationships with student on-task behaviour and negative correlations with student unwanted behaviour. This would reflect an effective punisher or intervention.

The significant real-time correlation between teacher reprimand and student unwanted behaviour ($r=0.311$, $p<0.001$) indicates an immediate high correspondence between reprimand and unwanted behaviour rather than it being consequential. The data indicates that the reprimands are questionably effective, neither relationship being significant.

Table 5.5.11 Correlation of Teacher Reprimand of the Target Student (270) and Student On-Task Behaviour and Student Unwanted or Competing Behaviour with Lags on Teacher Reprimands, Teacher 2005

Teacher 2005:	**one interval lag on unwanted behaviour**	**real time recording**	**one interval lag on reprimands**	**two interval lag on reprimands**	**three interval lag on reprimands**	**four interval lag on reprimands**
	-1	**0**	**-1**	**-2**	**-3**	**-4**
correlation reprimand and unwanted behaviour	-0.110	-0.006	-0.012	-0.081	0.017	-0.060
correlation reprimand and on task behaviour	0.127	0.127	0.112	**0.255**	0.203	0.199

For teacher 2005, there is not a high correspondence between reprimand and unwanted behaviour either contiguously or with a one interval lag. Reprimands

related negatively although not significantly with student unwanted behaviour and on the second lag, positively and significantly with student on-task behaviour, indicating a minimal effect in increasing student on-task behaviour.

Table 5.5.12 shows the real-time recordings for student on-task behaviour, unwanted behaviour and teacher 2005's sole reprimand adjacent to and including interval 33. Figure 5.5.19 places this data in the wider context, teacher reprimand occurred after the fourth interval in which unwanted behaviour had occurred.

Table 5.5.12 Real-Time Recordings Related to Teacher 2005 Reprimand of the Target Student

Interval:	**30**	**31**	**32**	**33**	**34**	**35**	**36**
on-task behaviour:	27	60	52	**42**	54	60	60
unwanted behaviour:	14	0	8	**2**	0	0	0
teacher reprimand (270):	0	0	0	**2**	0	0	0

For the first 29 minutes, unwanted or competing behaviour was nil.

The correlations resulting from combining teacher reprimands and behaviour talk and student on-task and unwanted or competing behaviour are shown in the following Table (5.5.13).

Table 5.5.13 Correlation of Teacher Reprimands and Behaviour Talk, Student On-task Behaviour and Student Unwanted or Competing Behaviour

Correlation Of Teacher Reprimands And Behaviour Talk		**Teacher 2004**		**Teacher 2005**		
Differentiated And Student On Task And Unwanted or	**Behaviour Code:**	**on task behaviour**	**unwanted behaviour**	**on task behaviour**	**unwanted behaviour**	
Competing Behaviour:						
student on task behaviour	301/302/320	1.000		1.000		
student unwanted behaviour	330/305/6/7/8/340/350/360		1.000		1.000	
	207/203	**0.232**	-0.077	0.100	-0.072	
teacher reprimands and behaviour talk to target student	270/230	0.015	0.082	-0.015	0.100	
teacher reprimands and behaviour talk to other students	271/231	0.111	-0.154	0.109	0.181	
the sum of teacher reprimands and behaviour talk	207/203/270/230/271/231	**0.256**	-0.113	0.127	-0.006	

For teacher 2004, both teacher reprimands and behaviour talk to the whole class and all teacher reprimands and behaviour talk combined correlated positively with student on-task behaviour ($r=0.232$, $p<0.05$ and $r= 0.256$, $p<0.05$ respectively) albeit these reflect small effect sizes. In contrast reprimands alone directed toward the target student (270) correlated significantly with unwanted or competing behaviour for teacher 2004 (Figure 5.5.16, Table 5.5.8). Reprimands and behaviour talk to the target student (270/230) showed minimal relationship with either on-task

behaviour or unwanted or competing behaviour for both teachers. Including orders and threats from the teacher to the target student reduced the correlation with student unwanted or competing behaviour for teacher 2004 to r=0.104. Previously, the correlation was, r=0.311.

Commentary Student unwanted or competing behaviour (Figure 5.5.14 and Table 5.5.6) was equivalent for both teacher 2004 and teacher 2005 (2.43 seconds per minute and 0.80 intervals and 2.37 seconds per minute and 0.32 intervals). The mean of teacher reprimands and behaviour talk for teacher 2004 was 6.00 seconds per minute and 0.89 intervals, for teacher 2005 this was 1.98 seconds per minute over 0.38 intervals. Student unwanted or competing behaviour increases over time, more so for teacher 2005 which is surprising as he is not the teacher experiencing difficulty.

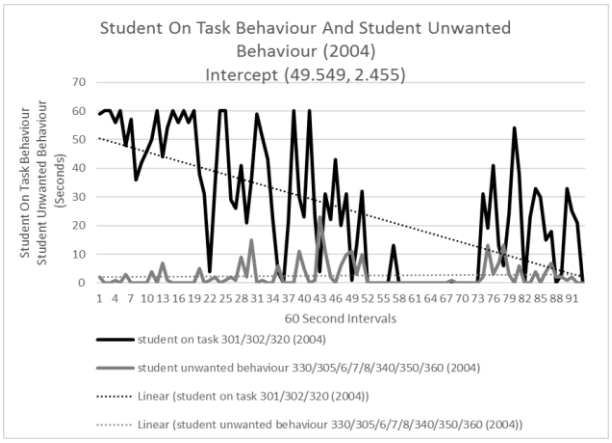
For teacher 2004, teacher reprimands to the target student related positively with student unwanted or competing behaviour ($r= 0.311$, $p< 0.001$), which without a lag on reprimand and behaviour talk to show the subsequent nature of the relationship indicates the immediacy of the reprimand. The positive value may reflect reprimands being a discriminative and or reinforcing stimulus for unwanted behaviour in this instance. The sum of teacher reprimands related significantly neither with on-task behaviour nor unwanted behaviour for both teachers.

Teacher 2004 reprimands in the earlier stages of class are succeeded by a reduction in unwanted or competing behaviour – latterly this is associated with an increase. For teacher 2005 (Figure 5.5.19), the target student is reprimanded only once by the teacher and this is succeeded by seven minutes of no further unwanted or competing behaviour**.** These figures, as do the relative durations of the reprimands, reflect the relative difficulties teacher 2004 was having with this student – and the approach adopted by teacher 2005 which was minimal attention of any sort.

For teacher 2004, both teacher reprimands and behaviour talk to the whole class (all targets combined) and all teacher reprimands and behaviour talk combined correlated positively with student on-task behaviour ($r=0.232$, $p<0.05$ and $r=0.256$, $p<0.05$ respectively) albeit these reflect small effect sizes. In contrast reprimands

alone directed toward the target student (270) correlated significantly with unwanted or competing behaviour for teacher 2004 (Figure 5.5.16, Table 5.5.8). These results, as above, suggest teacher reprimand and behaviour talk for teacher 2004 has increasingly become a discriminative stimulus for unwanted behaviour. Reprimands and behaviour talk to the target student (270/230) showed minimal relationship with either on-task behaviour or unwanted or competing behaviour for both teachers. The insignificant correlations for teacher 2005 on these variables is unsurprising given the lack of focus on, or avoidance of (Carr et al., 1991), the target student and relatively less reprimands and behaviour talk both severally and combined.

The Relationship between Student On-Task behaviour and Student Unwanted or Competing Behaviour

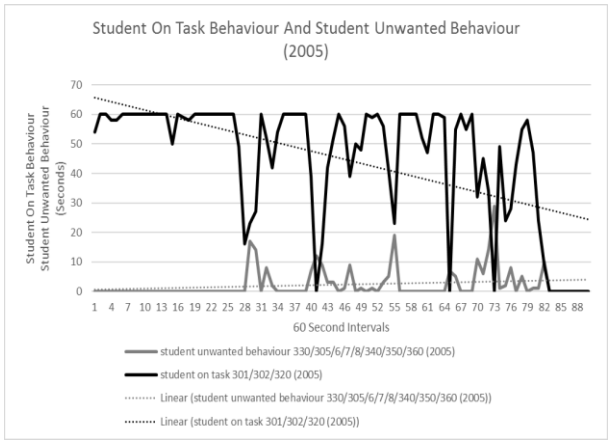


r= -0.065

y (on-task behaviour) = -0.5271x + 51.001

y (unwanted behaviour) = 0.0094x + 1.3883

Figure 5.5.20 Student (3007) On-Task Behaviour and Unwanted or Competing Behaviour for Teacher 2004 with Trend Lines and Intercept



r=0.450

y = -0.4651x + 66.238

y = 0.0372x + 9.6841

Figure 5.5.21 Student (3007) On-Task Behaviour and Unwanted or Competing Behaviour for Teacher 2005 with Trend Lines and Intercept

Student on-task behaviour decreases for both teachers over time, for teacher 2004 the initial level is lower and the intercept of on-task behaviour and unwanted or competing behaviour occurs prior to class end. For teacher 2005, student on-task behaviour begins at a higher level (60 seconds per minute) and begins varying in interval 29 at the point unwanted or competing behaviour begins. Student unwanted behaviour for teacher 2004 is relatively consistent across time. The slope, or rate of

decrease of student on-task behaviour is greater for teacher 2004. The rate of increase in student unwanted behaviour is greater for teacher 2005.

Table 5.5.14 The Percentage of Target Student Social Talk to Other Students in Student Unwanted Behaviour

Percentage Of Target Student Unwanted Behaviour			
That Is Social Talk To Other Students:			
2004		**seconds per minute:**	**incidents per minute:**
target student social talk to other student	330	1.366	0.280
student unwanted behaviour	330/305/6/7/8/340/350/360	2.430	0.462
percentage of social talk to other students	percentage	56.195	60.465
2005			
target student social talk to other student	330	1.833	0.278
student unwanted behaviour	330/305/6/7/8/340/350/360	2.378	0.322
percentage of social talk to other students	percentage	77.103	86.207

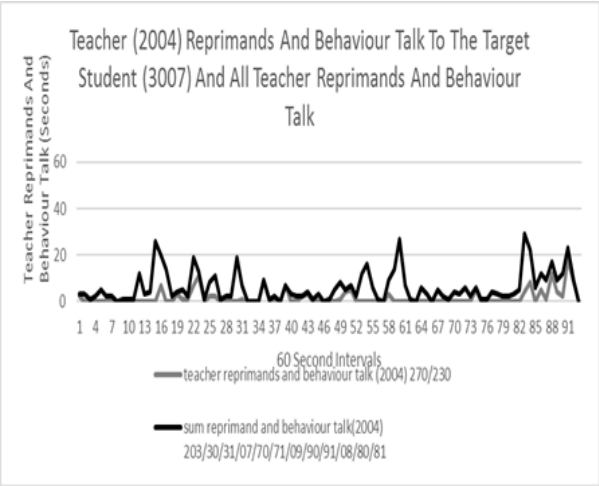
Table 5.5.14 indicates a greater extent of extreme behaviour for teacher 2004 relative to teacher 2005 both by time (seconds duration) and incidents per minute. Student social talk to other students constitutes the greatest amount of student unwanted behaviour for both teachers.

Teacher Reprimands and Behaviour Talk

Table 5.5.15 The Rate of (Incidents and Seconds per Minute) of Teacher Reprimands and Behaviour Talk Differentiated by Target

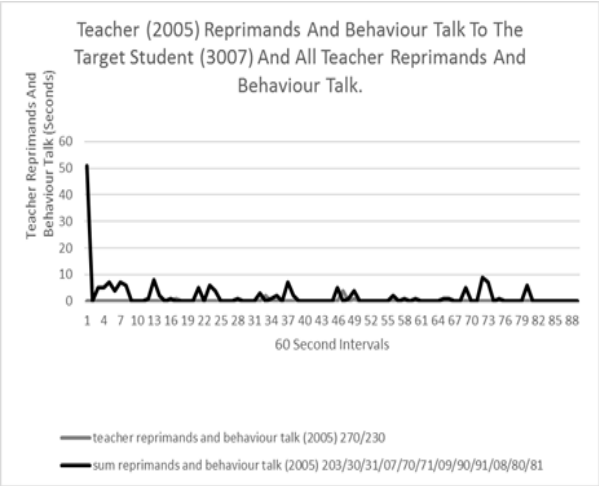
Teacher:		**2004**		**2005**	
Behaviour:	**Code:**	**time/min**	**incidents/min**	**time/min**	**incidents/min**
teacher reprimand and behaviour talk to whole class	207/203	1.269	0.344	1.011	0.144
teacher reprimand and behaviour talk to target student	270/230	1.441	0.301	0.089	0.044
teacher reprimand and behaviour talk to other students	271/231	3.215	0.763	0.889	0.322
mean of reprimand and behaviour talk to others		0.161	0.763	0.044	0.322
all teacher reprimand and behaviour talk	207/203/270/230/271/231	5.925	0.892	1.989	0.378

Table 5.5.15 shows teacher reprimands and behaviour talk differentiated by target. Figure 5.5.22 and Figure 5.5.23 show teacher reprimands and behaviour talk to the target student and all teacher reprimands and behaviour talk combined.



r= 0.53

Figure 5.5.22 Teacher (2004) Reprimands and Behaviour Talk to the Target Student and all Teacher Reprimands and Behaviour Talk



r= -0.04

Figure 5.5.23 Teacher (2005) Reprimands and Behaviour Talk to the Target Student and all Teacher Reprimands and Behaviour Talk

Figure 5.5.22 shows a close association between teacher reprimands and behaviour talk to the target student, and total teacher reprimands behaviour talk, orders and threats ($r=0.53$, $p<0.001$) for teacher 2004. This depicts the degree to which teacher reprimands and behaviour talk to the target student constitute a significant part of all reprimands and behaviour talk combined.

Figure 5.5.23 shows teacher 2005 reprimand and behaviour talk to the whole class at the outset of class and the persistence of this for some eight intervals (minutes). The low negative correlation reflects the lack of association between reprimand and behaviour talk targeting the target student and overall reprimand and behaviour talk. This contrasts with teacher 2004 (Figure 5.5.22) showing relative teacher reprimand and behaviour talk to the target student being a significant percentage (c.70%) of all teacher reprimand and behaviour talk. These results show the focus of teacher 2004 on the target student is considerably greater relative to other students and teacher 2005.

These differences are reflected in the relative rates of teacher reprimands and behaviour talk (Table 5.5.15) by the respective teachers 2004 (1.44 seconds per minute) and 2005 (0.089 seconds per minute) directed to the target student.

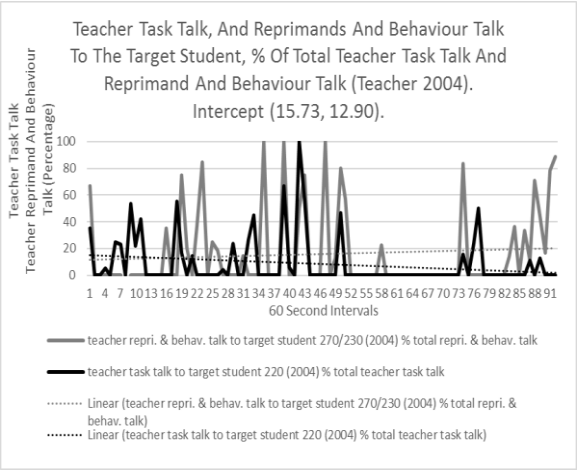


Figure 5.5.24 Teacher (2004) Task Talk, and Reprimand and Behaviour Talk to the Target Student, as a Percentage of Total Teacher Task Talk and Reprimand and Behaviour Talk, with Trend Lines and Intercept

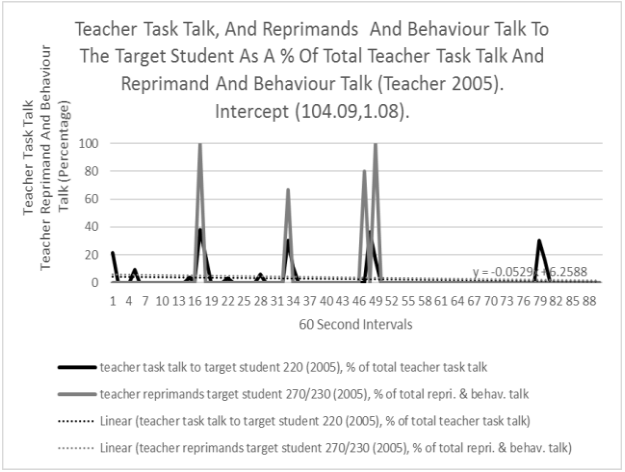


Figure 5.5.25 Teacher (2005) Task Talk, and Reprimand and Behaviour Talk to the Target Student, as a Percentage of Total Teacher Task Talk and Reprimand and Behaviour Talk, with Trend Lines and Intercept

Figure 5.5.24 shows teacher 2004 focus, teacher task talk to the target student as a percentage of all teacher task talk and teacher reprimand and behaviour talk to the target student as a percentage of all teacher reprimand and behaviour talk, to be considerably greater than teacher 2005 (Figure 5.5.25) in respect to duration both within and across intervals. The trend lines in Figure 5.5.24 show teacher 2004 reprimands and behaviour talk exceeding teacher task talk in interval 15.73, this indicating the increasingly negative valence of teacher–target student interaction as a percentage of all teacher task talk and reprimands and behaviour talk. This negative trend is indicated at the outset of class as is reflected in the high percentage of reprimand and behaviour talk directed to the target student within the first two intervals. In contrast teacher 2005 data (Figure 5.5.25) indicates greater relative task talk to the target student at the outset of class. Whilst teacher task talk to the target student for teacher 2004 is greater than teacher 2005 (duration), reprimands and behaviour talk to the target student for teacher 2005 are associated with greater relative amounts of task talk.

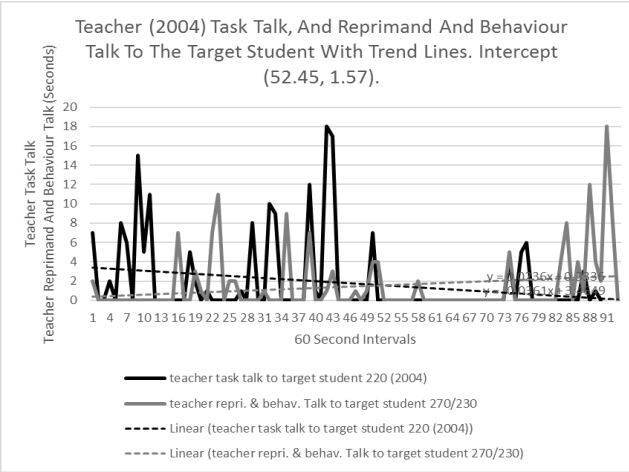


Figure 5.5.26 Teacher (2004) Task Talk and Reprimand and Behaviour Talk to the Target Student with Trend Lines and Intercept

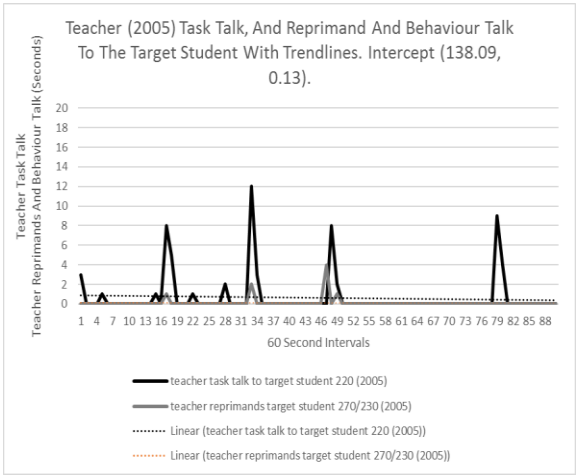


Figure 5.5.27 Teacher (2005) Task Talk and Reprimand and Behaviour Talk to the Target Student with Trend Lines and Intercept.

The student was sent from the class in interval 53 by teacher 2004, briefly reappeared in intervals 57 and 58 where he was again summarily dismissed (Figure 5.5.26).

His subsequent return to class and exit was of his own volition, independent of teacher wishes. This occurred nine times (Figure 5.5.26). His removal occurred at the point teacher reprimands and behaviour talk to him intersected with teacher task talk to him, and began exceeding teacher task talk to him. This intersect reflects her endeavours to manage him via personalised task talk and reprimand.

For teacher 2004, after initial dismissal the student defined whether or not he would remain in class. For teacher 2005, once dismissed (interval 83) the student was out of class (Figure 5.5.27).

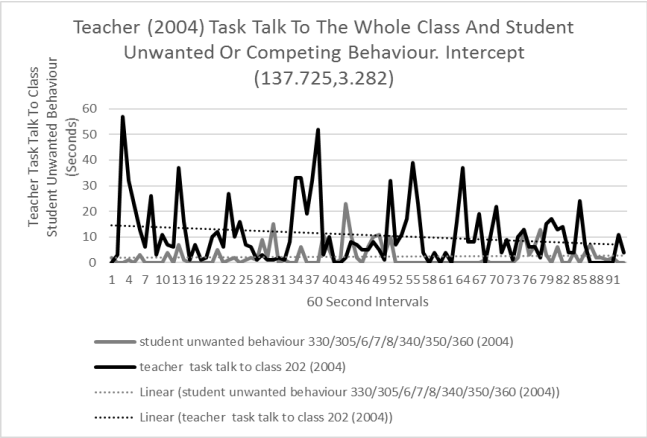


Figure 5.5.28 Teacher (2004) Task Talk to the Whole Class and Student Unwanted or Competing Behaviour with Trend Lines and Intercept

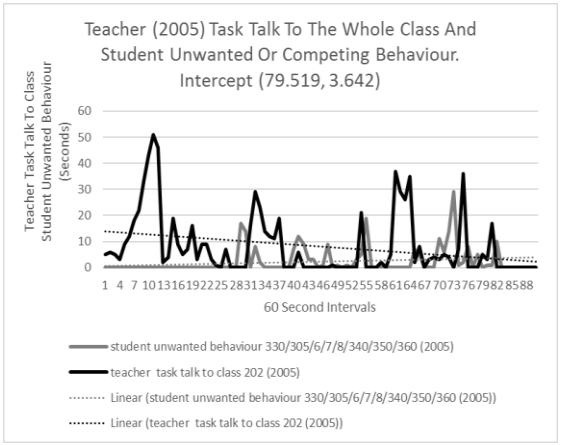


Figure 5.5.29 Teacher (2005) Task Talk to the Whole Class and Student Unwanted or Competing Behaviour with Trend Lines and Intercept

The student was sent from class 2005 in interval 83 which approximates the intercept between teacher task talk to the whole class and unwanted or competing behaviour (Figure 5.5.29). The correlation between teacher task talk to the whole class (202) for teacher 2005 and student on-task behaviour (301/302/320) was r= 0.549, $p<0.001$. This intercept reflects the teacher's minimal interaction with the target student and management of him principally via task talk to the whole class.

Commentary Teacher 2005 began class with 8 intervals (minutes) of reprimand and behaviour talk to all targets combined. This 'over-arching' non-contingent reprimand and behaviour talk was also apparent for the Primary School data (Section 5.2) and is seen as emphasising an overriding negative reinforcement paradigm. For teacher 2005 student unwanted or competing behaviour began (17 seconds duration) in interval 29, this succeeding zero teacher task talk in interval 28. This is consistent with the view that 'if you leave gaps, the students will fill them.' The rate of decrease of student on-task behaviour is greater for teacher 2004. Student on-task behaviour and teacher task talk decrease over time, the former more so for student on-task behaviour. The rate of increase in student unwanted behaviour is greater for teacher 2005. Differentiating student unwanted behaviour in to social talk to other student and 'other' combined indicated teacher 2004 had considerably more extreme behaviour than teacher 2005.

Figure 5.5.22 shows a close association between teacher reprimands and behaviour talk to the target student, and total teacher reprimands behaviour talk, orders and threats ($r=0.53$, $p<0.001$) for teacher 2004. This depicts the degree to which teacher reprimands and behaviour talk to the target student constitute a significant part of all reprimands and behaviour talk combined and also reflects this student's role in effecting 'class infection' in regard to unwanted behaviour, and perseveration and generalisation of the teacher's behaviour both within and upon his removal from class (intervals 52 to 73). Returning to class 9 times after being dismissed indicates the extent to which he was defining events within class.

The point of excluding the student from class is an interesting reflection of the differing management styles. For teacher 2004, management consisted of target student directed (personalised) task talk and reprimand in excess of the mean of what was delivered to other students. At the point (or near) at which reprimand and behaviour talk exceeded task talk he was dismissed (Figure 5.5.26). For teacher 2005 management involved minimal individual (personal) interaction and whole class instruction or task talk. At the point (or near) of unwanted or competing behaviour exceeding teacher task talk to the whole class, the student was dismissed (Figure 5.5.29).

Teacher Proximity to the Target Student

Table 5.5.16 Correlation of Teacher Proximity to the Target Student with Teacher Task Talk, Teacher Reprimands, Student On-Task Behaviour and Student Unwanted or Competing Behaviour

Teacher Proximity To Target Student (201):	**Code:**	**Correlation:**	
Behaviour:		**2004**	**2005**
teacher proximity to target student	201	1.000	1.000
teacher task talk to target student	220	**0.364**	**0.403**
target student on task behaviour	301/302/320	-0.100	0.108
target student unwanted behaviour	330/305/6/7/8/340/350/360	**0.377**	-0.047
teacher reprimand and behaviour talk to target student	270/230	0.130	**0.382**

Teacher proximity to the target student related positively with task talk to the target student for both teachers ($r=0.364$, $p<0.001$ and $r=0.403$, $p<0.001$ respectively). These reflect medium to large effect sizes. No relationships between teacher proximity and student on-task behaviour were evident.

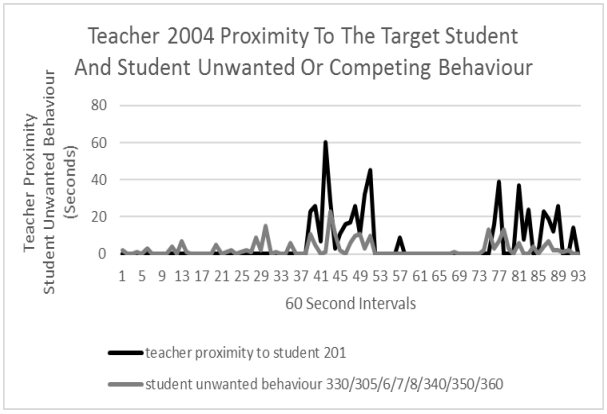


Figure 5.5.30 Teacher 2004 Proximity to the Target Student and Student Unwanted or Competing Behaviour

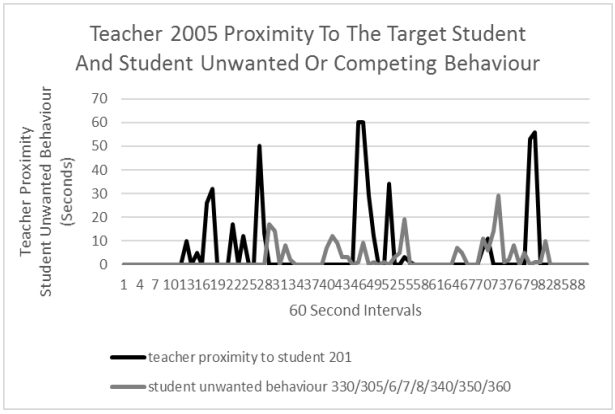


Figure 5.5.31 Teacher 2005 Proximity to the Target Student and Student Unwanted or Competing Behaviour

For teacher 2004, teacher proximity was associated with student unwanted behaviour ($r=0.377$, $p<0.001$) for teacher 2005, $r=-0.047$. For teacher 2005, teacher reprimand and behaviour talk to the target student was related ($r=0.382$, $p<0.001$) with teacher proximity. Visually, Figures 5.5.30 and 5.5.31, indicate teacher proximity to the target student given student unwanted behaviour.

Commentary The significant correlation between teacher 2004 proximity to the target student with student unwanted or competing behaviour indicates that proximity in this instance is not associated with any reduction in such behaviour, rather indicates that proximity is a discriminative stimulus for the occurrence of unwanted behaviour. This is consistent with the expressed and observed data for this teacher.

The relationship for teacher 2005 proximity to the target student and reprimand and behaviour talk to them ($r=0.38$, $p<0.001$) is consistent with the literature indicating that such proximity enhances the effectiveness of reprimands and classroom management (Evertson, 1989; Lewis and Sugai, 1999; Shores, Jack et al, 1993; Gunter, Shores et al, 1995).

Summary and Discussion

In this analysis, teacher 2004 focus toward the target student was greater across all measured behaviour; task talk (220), behaviour talk (230), social talk (240), reprimands (270), praise for work (250), praise for behaviour (260) and reprimand and behaviour talk (270/230) than teacher 2005.

Despite the observed and expressed loss of control experienced by teacher 2004, unwanted or competing behaviour occurred 2.43 seconds per minute for teacher 2004, for teacher 2005, 2.38 seconds.

Student on-task behaviour was markedly different between the two teachers, 2004 and 2005, 26.2 seconds per minutes and 45.08 seconds respectively.

Both teachers' task talk was equivalent and low and decreased over the duration of the classes. Reciprocal teacher – student task talk was considerably greater for teacher 2004 than teacher 2005 however similar significant correlations indicated equivalent responsiveness between teachers. Reciprocal teacher – student task talk was not related with student on-task behaviour.

Previous analysis (Sections 5.1, 5.2, 5.3 and 5.4) has shown that teacher task talk to the target student is not positively related to student on-task behaviour. This finding is consistent with the current data for teacher 2004. For teacher 2005 a whole class and other student focus realised a positive relationship between teacher task talk to the whole class and target student on-task behaviour.

Looking at previous data (Section 5.4), the rates of teacher task talk (both the sum and task talk directed to the whole class) for both teachers in the current analysis does not appear sufficient to retain a high level of student on-task behaviour. Teacher task talk and student on-task behaviour trended downward over the course of the class for both teachers. The rates of unwanted or competing behaviour were equivalent for both teachers 2004 and 2005 (2.430 and 2.377 seconds per minute respectively), although graphically were quite different. Student unwanted or competing behaviour for teacher 2004 had become pervasive from the outset of class and showed a positive relationship with teacher reprimands directed to him, this indicating not only the congruence of the two variables but also that reprimands had a reinforcing component. For teacher 2005, unwanted or competing behaviour correlated significantly and negatively with student on-task behaviour. This is what would be expected from greater student engagement (Lane, 1999, 2001).

For teacher 2004 the relationship was neutral indicating student on-task behaviour to be independent of unwanted or competing behaviour.

Teacher task talk and reprimands to the target student for teacher 2004 were greater than the mean of those directed to other students.

Mean reprimands and behaviour talk for teacher 2004 were considerably higher than teacher 2005 in regard to dispersion across intervals and duration and evidenced greater variability

The variability found in reprimands and behaviour talk for teacher 2004 combined is consistent with that found when the data is differentiated in to those teachers with expressed management difficulty (Section 5.5). The 'burst' of teacher 2005 reprimand and behaviour talk to the whole class at the outset of class (Figure 5.5.23) in regard to incidents per minute and duration (seconds per minute) appears defining in the sense of a setting event to establish whole class teacher instruction (or task talk and reprimands and behaviour talk) as the loci of control. The high rate (incidents per minute and seconds per minute) of teacher 2004 reprimand to the target student at the outset of class appears defining of a continued high rate of targeted reprimand. Interestingly, for teacher 2004, teacher reprimands and behaviour talk to the whole class correlated significantly with student on-task behaviour. This was not the case for teacher 2005. This may reflect the temporary removal of negative teacher attention from the target student and an endeavour to maintain this change by teacher 2005.

The trend lines in Figure 5.5.26 show Teacher 2004 reprimands and behaviour talk exceeded teacher task talk in interval 15.73, this indicating the increasingly negative valence of teacher-target student interaction as a percentage of all teacher task talk and reprimands and behaviour talk. This negative trend is indicated at the outset of class as is reflected in the high percentage of reprimand and behaviour talk directed to the target student within the first two intervals. In contrast teacher 2005 data (Figure 5.5.27) indicates greater relative task talk to the target student at the outset of class. Whilst teacher task talk to the target student for teacher 2004 is greater than teacher 2005 (seconds per minute), reprimands and

behaviour talk to the target student for teacher 2005 are associated with greater relative amounts of task talk.

In previous analysis (Section 5.4) of those teachers expressing management difficulty and those not, respective rates of unwanted or competing behaviour were 6.975 and 2.363 seconds per minute. In the current study, student unwanted or competing behaviour was 2.430 seconds per minute for teacher 2004 and 2.378 seconds per minute for teacher 2005.

In Section 5.4, it was concluded that, "a high correspondence between teacher reprimands and behaviour talk and unwanted or competing behaviour for the first twenty minutes of class time whilst maintaining teacher task talk at a high level (greater than 50% of time) is sufficient to contain this unwanted behaviour for student on-task behaviour to persist at a high level over time." Mean student on-task behaviour of 49.030 seconds per minute.

In the current study (Section 5.5), teacher 2005 student unwanted or competing behaviour for the first 28 minutes of class time was zero whilst teacher task talk to the class reduced over the 28 minutes to zero levels (Figure 5.5.22). Student on-task behaviour (mean 45.06 seconds per minute) reduced from a maximum of 60 seconds to 16 seconds per minute over the same period. The overall correlation between teacher task talk to the whole class and student on-task behaviour, $r=0.549$ (Table 5.5.3). In the previous study this was; $r=0.600$, $p<0.001$. In this study, there is greater variability of teacher task talk to the whole class and aside from the initial 'burst' of reprimand and behaviour talk minimal rates of this thereafter, and minimal relationship with unwanted or competing behaviour. It appears that maintaining the relationship between teacher task talk to the whole class, be it through an initial 'burst' of reprimand and behaviour talk and minimal teacher behaviour directed to the target student was sufficient to maintain a variably high rate of student on-task behaviour. The overall impression was that the class was too long for all three participants, as is indicated by decreasing teacher task talk and increasing student unwanted behaviour.

Teacher 2004 focussed on the target child, gave greater attention (task talk) to task, had greater congruity of reprimand with unwanted behaviour, albeit showed

greater and increasing attention to unwanted or competing behaviour and decreasingly to student on-task behaviour with a resultant rate of student on-task behaviour of 26.20 seconds per minute.

Maintenance of the relationship between teacher task talk to the whole class with lesser interaction with the target child (teacher 2005) maintained better student on-task behaviour (45.06 seconds per minute). This is consistent with findings from Section 5.2 where the data (not truncated) for Intermediate Schools were associated with low rates of student unwanted behaviour given reduced rates of both teacher task talk and student on-task behaviour whilst retaining a high correspondence between teacher task talk and student on-task behaviour.

The different management styles with the one class are probably salient and indicative of the behavioural contrast in the student's behaviour and the consequent high level of teacher 2004's rate of ineffective reprimand to the target student.

Teacher praise for work by both teachers was minimal. For teacher 2004, 0.066 seconds per minute and for teacher 2005, 0.033 seconds per minute.

Teacher praise (Table 5.5.5) for work or behaviour did not relate with either student on-task behaviour or unwanted or competing behaviour for either teacher.

Teacher proximity to the target student was positively related with teacher task talk to the target student for both teachers. This was not the case for student on-task behaviour.

The significant correlation between teacher 2004 proximity to the target student with student unwanted or competing behaviour indicates that proximity in this instance is not associated with any reduction in such behaviour, rather indicates that proximity is a discriminative stimulus for unwanted behaviour. This is consistent with the expressed and observed data for this teacher.

The relationship for teacher 2005 proximity to the target student and reprimand and behaviour talk to them ($r=0.382$, $p<0.001$) is consistent with the literature indicating that such proximity enhances the effectiveness of reprimands and classroom management (Evertson, 1989; Lewis and Sugai, 1999; Shores, Jack

et al, 1993; Gunter, Shores et al., 1995), albeit that teacher reprimand to the target student occurred on only the one occasion.

Numerous researchers have found teacher behaviour to be variably discriminative and avoidant of student problem behaviour. For example, Van Acker, Grant and Henry (1996) found the most predictable sequence of teacher–student interactions occurred during episodes of teacher reprimands for inappropriate behaviour for students at risk for EBD. Nelson and Roberts (2000) found teachers "were more likely to respond negatively to disruptive behaviors of target students than to those of criterion students" (p.27).

Carr, Taylor and Robinson (1991, p. 523) found that "adults engaged in teaching activities with non-problem children more often than with problem children … when an adult worked with a problem child the breadth of instruction was more limited (fewer task demands were presented) and typically involved those tasks associated with lower rates of problem behaviour.

It was expected, given low rates of all teacher task talk, that effective management would involve greater application of known behavioural principles in respect to attention for work and praise for work for wanted behaviour, and reprimand, 'planned ignoring' (selective attention) for unwanted behaviour (Sherrill et al., 1996; Lerman and Vorndran, 2002; Sutherland et al., 2008). It was expected that these strategies would be proactively pursued and that there would be obvious indication of contiguous and contingent association between teacher–student behaviour (albeit that Sections 5.1, 5.2, 5.3 and 5.4 indicate teacher behaviour directed toward a target student consistently was found to relate negatively to student on-task behaviour).

In the current study, one teacher used an individual focussed attention for work and reprimand approach (teacher 2004), the other (teacher 2005) a whole class focus and other student focus, avoidant of the target student. The latter was more effective in realising less unwanted behaviour, greater on-task behaviour and remaining in class for a considerably longer period of time. As was reported by Sherrill and associates (1996), "if you can reprimand only a small proportion of the

child's solicitations for attention, ignore rather than attend to the rest … attending to a misbehaviour is a serious mistake when few misbehaviours are reprimanded."

For teacher 2004, the target student was removed from class at the point teacher reprimands and behaviour talk to him intersected with teacher task talk to him, and began exceeding teacher task talk to him (Figure 5.5.26). The student was sent from class 2005 in interval 83 which approximates the intercept between teacher task talk to the whole class and student unwanted or competing behaviour (Figure 5.5.29). For both teachers, removal coincided with their respective approaches no longer being effective.

It is more practicable to maintain a high rate of task talk that is public in nature, than it is to selectively ignore or attend to an individual. Despite the diminishing rates of teacher task talk to the whole class and combined and student on-task behaviour, the overall correlation between teacher task talk to the whole class and combined and student on-task behaviour, $r=0.549$, $r=0.382$, $p<0.001$) was retained for teacher 2005. This was associated with a better overall outcome.

These results are consistent with the overall thesis presented in this study as to the importance of teacher task talk, to the whole class and to all targets combined, in prescribing and maintaining an on-task focus in students and also consistent with the findings that an individual focus is of lesser utility than a whole class focus (Hypotheses $H_{overarching}$, H_1, and H_1).

The results from this Section were used to inform the analysis in Section 5.6

5.6 Increasing Teacher Task talk, a Case Study

Introduction

Considerable research has been undertaken in to those factors that both reduce student problem behaviour and increase student task engagement. Some of these factors have been summarised by Sutherland (2008, p.226): **"**The ability of teachers to provide quality instruction (e.g., promoting frequent rates of students'

correct responses) to students with EBD (emotional and behavioural disorders) is another factor that contributes to the quality of teacher–student interactions (Wehby et al., 1998). For example, providing frequent praise and OTRs (opportunities to respond) to academic requests (e.g., Sutherland, Alder, & Gunter, 2003; Sutherland, Wehby, & Copeland, 2000) seems to improve the student's behaviour in the classroom. Sutherland et al. (2000) found increases in task engagement when a teacher increased his rate of behaviour-specific praise. Sutherland et al. (2003) found that increased rates of OTR resulted in increased rates of correct responses and task engagement and in decreased rates of disruptive behaviour.

Researchers in emotional and behavioural disorders (EBD), in targeting only one level of the classroom context, have focussed on interventions to reduce problem behaviour. Implicit in this approach is that by reducing problem behaviour, students' academic and social outcomes might improve. Although this assumption may have some merit, for many students with EBD simply reducing disruptive behaviour might not result in a change in the one behaviour that appears to be associated with learning and behaviour problems: task engagement. Moreover, by ignoring the associated academic problems often concurrent with problem behaviours, treatment efficacy has been further limited (Sutherland, 2008, p. 227).

In the writer's experience, across home, school and institutional settings, the maintenance of attention, application to task and performance (instructional control) are a function of rates of task talk (including interactive 'probes' or opportunities to respond). This provides the base and requisite contrast (setting event/establishing operation/discriminative stimuli) upon which praise and reprimands gain their effect. In addition, this enables distractibility, off-task and inappropriate behaviour to be better addressed by task or work-related redirection as opposed to addressing problem behaviour directly. Reprimands mainly result in the immediate suppression of unwanted behaviour, albeit temporarily. To be effective, punishment should stop when the behaviour stops **(**Lerman and Vorndran, 2002). Any ongoing positive effect from such intervention is dependent on the immediacy of redirection to work, directing task related attention to the on-task behaviour of others (reducing the public nature of the intervention), and all within

the period in which the unwanted behaviour is attenuated, i.e., the teacher continuing to proactively define the situation.

If teacher talk is task/activity specific and this focus is frequent and ongoing, this defines the situation, behavioural expectation and performance … 'if you focus on what you want, you are more likely to get it.' A rate of teacher task talk that has resulted in diminishing returns has not been observed.

Research has not evaluated 'task talk' in any but a cursory descriptive manner (most teacher talk was 'neutral' (Shores, 1993), or was 'feedback on performance,' (Galton, Simon & Croll, 1980); or 'were instructional sequences,' (Gunter, Shores, Rasmussen & Flowers, 1993; Shores, Gunter & Jack, 1993), 'academic or social requests' (Wehby, Symons & Shores, 1995), not in respect to function. The frequency and dispersion (rate) and duration of task talk could be said to be prescriptive in defining the setting event, reinforcement context, teaching relationship and reinforcement for academic performance – providing discriminative stimuli for the maintenance of attention and academic performance, and co-requisite in maintaining this. Thus, the greater the rate of task talk, the greater rates of performance and lesser rates of competing behaviour will be realised, and that this will be particularly apparent in respect of those children with poor social skills and pre-existing behaviour problems.

A case study was undertaken with a teacher having trouble in classroom management to test the above principles. By, firstly, increasing task talk and maintaining this as a public phenomenon, and, secondly, more specifically responding to all unwanted or competing behaviour with a task or work-related response (in addition to maintaining the increase in task talk).

In keeping with the hypotheses below that:

A high rate of teacher task talk would be associated with a high rate of student on-task behaviour. High rates of teacher task talk are both discriminative stimuli for gaining and maintaining task orientation, are prescriptive or defining of the contingency operating for student attention and behaviour (Hypothesis H_1); and that a high rate of teacher task talk would be associated with reduced rates of student

unwanted or competing behaviour. Competing or unwanted behaviour, such as talking with peers, would be expected to be more manifest in this 'void' of lesser teacher task talk. (Hypothesis H_2).

Method

Subjects The teacher was female and had been teaching for 8 years. The class comprised 15 male students, at year 10 (aged approximately 15 years). The school was decile 4. She was experiencing considerable difficulty in management of the class and was constantly taunted by the students for this. Involvement in the study was voluntary for both the teacher and students, the students who did not wish to participate were able to attend a different class for the duration of the study.

Results

Session 5419 represents the baseline condition. Sessions 5450 and 5462 represent sessions in which teacher task talk was increased (same teacher and same student). The first (Intervention 1) represents the general instruction to increase task talk and to maintain this as a public phenomenon, the second (Intervention 2) involved more specific instruction to as much as possible respond to all unwanted or competing behaviour with a task/work related response (in addition to Intervention1). This included responding to unwanted behaviour with task talk and continuing with this. Additionally, to 'talk out' whatever was being written on the 'white board' as it was being written. The other data shows concomitant changes in combined data for on-task behaviour, teacher reprimands and behaviour talk, all teacher praise and 'unwanted' or competing behaviour.

Change was only instigated regarding teacher task talk. The integrity of the adoption of the strategies is indicated by teacher task talk data across Interventions 1 and 2, and by the reduction in all teacher reprimands and behaviour talk implicit in implementing the second intervention.

Sessions 5436, 5461 and 5467 are the respective inter observer sessions for sessions 5419, 5450 and 5462 to calculate percentage agreement.

Table 5.6.1 Inter Observer Agreement for Baseline and Intervention Sessions

Inter Observer Agreement:				
Behaviour:	**Behaviour Code:**			
Session:		**5419/5436**	**5450/5461**	**5462/5467**
		% Agreement	**% Agreement**	**% Agreement**
		Combined Means:	**Combined Means:**	**Combined Means:**
teacher task talk	202/220/221	91.163	88.953	90.6
student on task	301/302/320	99	100	94.363
sum reprimands and behaviour talk	203/230/231/207/270/271	95.903	92.984	96.112
all teacher praise	205/250/251/206/260/261	100	95.912	97.778
social talk to other + abuse, etc.	304/5/6/7/8/330/340/350/360	95.098	94.63	98.734

Table 5.6.2 Teacher Task Talk, all Teacher Reprimands and Behaviour Talk, all Teacher Praise and Student Unwanted or Competing and On-Task Behaviour across Baseline and Intervention Sessions (Seconds per Minute)

This information is represented in the following figure:

Behaviour:	**Behaviour Code:**	**Session:**		
		5419	**5450**	**5462**
teacher task talk	202/220/221	18.242	27.545	28.873
student on task	301/302/320	16.03	37.764	38.4
sum reprimands and behaviour talk	203/230/231/207/270/271	6.061	5.073	3.054
all teacher praise	205/250/251/206/260/261	1.364	2.127	1.418
social talk to other + abuse, etc.	304/5/6/7/8/330/340/350/360	10.061	6.509	3.636

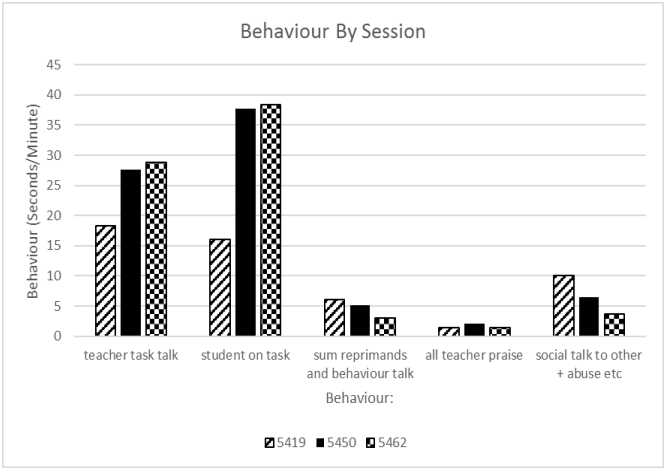


Figure 5.6.1 Teacher Task Talk, all Teacher Reprimands and Behaviour Talk, all Teacher Praise and Student Unwanted or Competing and On-task Behaviour across Baseline and Intervention Sessions – Bar Graph

The above data shows all recorded behaviour 'moving' in the expected direction. All teacher praise showed minimal change.

These data are further presented as a line graph with trend lines and cumulative duration chart format.

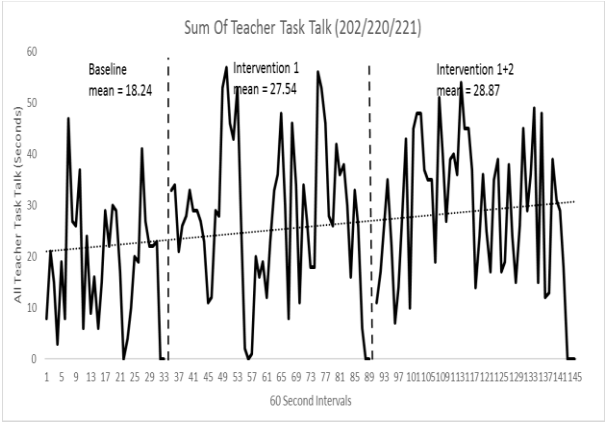


Figure 5.6.2 All Teacher Task Talk across Baseline and Intervention Sessions with Trend Line

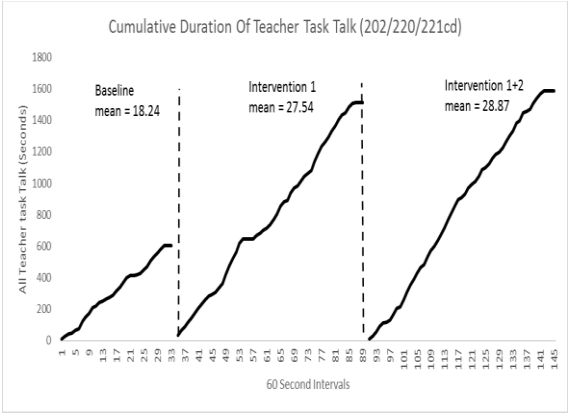


Figure 5.6.3 All Teacher Task Talk across Baseline and Intervention Sessions, – Cumulative Duration

Teacher task talk increased over both intervention sessions. The mean differences between Intervention 1 and 2 with baseline were 9.3 and 10.63 seconds per minute respectively. It should be noted that each session returns to zero demarking the conclusion of class. This has obviously reduced the mean changes depicted across all data sets. These data have been included as reducing the data to the point at which the class could be seen as actively functioning is necessarily an arbitrary operation. There remains variability in teacher task talk (seconds per minute) which probably reflects the newness of the change to the teacher and natural variation inherent in maintaining a higher level of task talk.

Figures 5.6.4 (line graph) and 5.6.5 (cumulative duration) show student on-task behaviour in the experimental conditions relative to baseline.

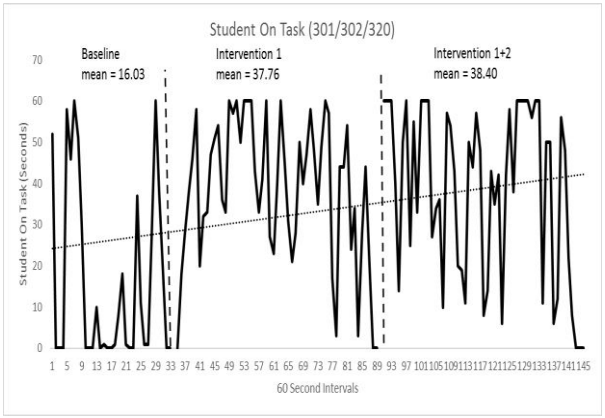


Figure 5.6.4 Student On-Task Behaviour across Baseline and Intervention Sessions with Trend Line

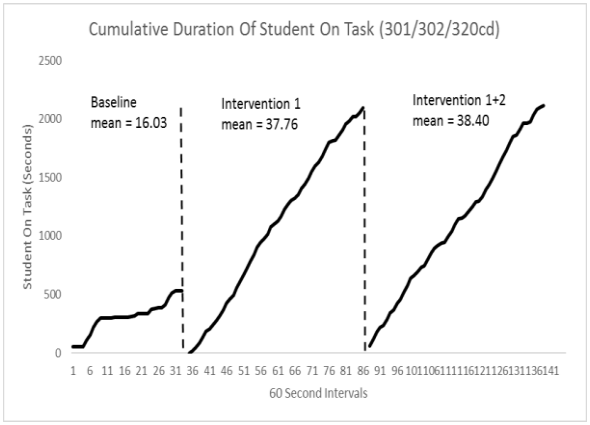


Figure 5.6.5 Student On-Task Behaviour across Baseline and Intervention Sessions, Cumulative Duration

Student on-task behaviour increased over both intervention sessions, markedly so in the first session. The mean differences between Intervention 1 and 2 with baseline were 21.73 and 22.73 seconds per minute respectively. With this change it would be expected that a corresponding reduction in student unwanted or competing behaviour would be realised.

Figures 5.6.6 (line graph) and 5.6.7 (cumulative duration) show student unwanted or competing behaviour in the experimental conditions relative to baseline.

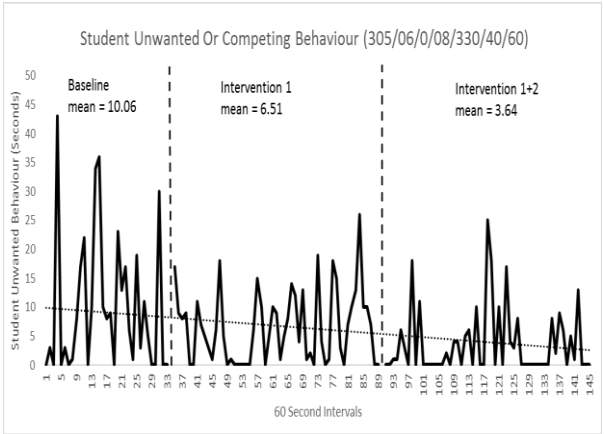


Figure 5.6.6 Student Unwanted or Competing Behaviour across Baseline and Intervention Sessions with Trend Line

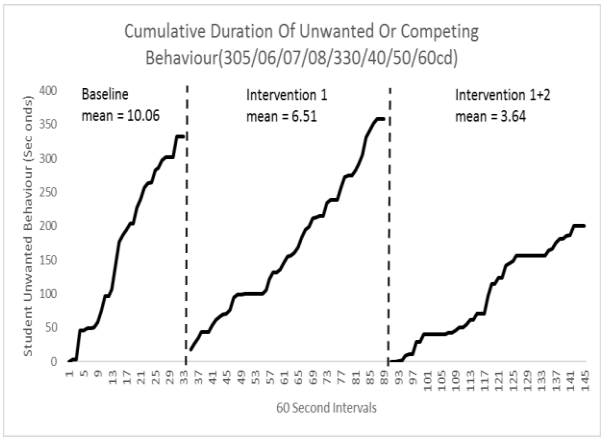


Figure 5.6.7 Student Unwanted or Competing Behaviour across Baseline and Intervention Sessions, Cumulative Duration (Seconds)

Student unwanted or competing behaviour decreased over both intervention sessions, more so in the second session. This is consistent with the instruction given

for this intervention – 'responding to unwanted behaviour with task talk.' With this change it was expected that a corresponding reduction in student unwanted or competing behaviour would be realised. The mean differences between Intervention 1 and 2 with baseline were 3.55 and 6.42 seconds per minute respectively.

Additionally, Intervention 2 was expected to affect a reduction in teacher reprimands and behaviour talk (Figures 5.6.8 and 5.6.9) and in so doing increase the general work or task focus within the classroom.

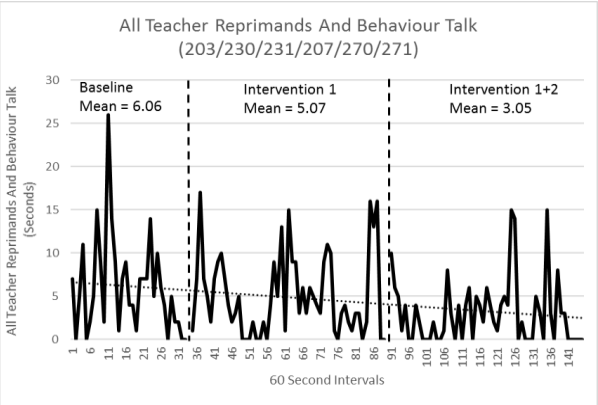


Figure 5.6.8 All Teacher Reprimands and Behaviour Talk across Baseline and Intervention Sessions with Trend Line.

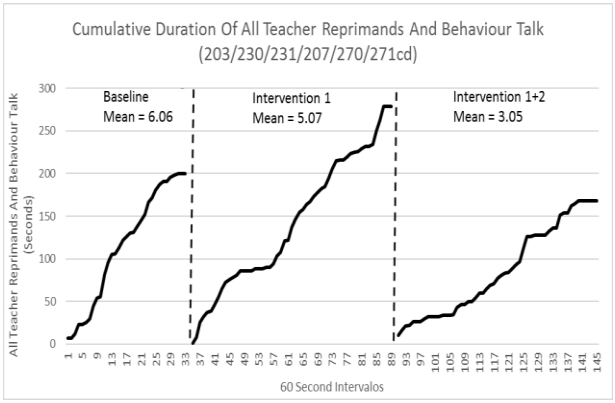


Figure 5.6.9 All Teacher Reprimands and Behaviour Talk across Baseline and Intervention Sessions - Cumulative Duration (Seconds).

All teacher reprimands and behaviour talk decreased over both intervention sessions, more so in the second session. The mean differences between Intervention 1 and 2 with baseline were 0.99 and 3.01 seconds per minute respectively. The minimal change between baseline and intervention 1 reflects both the ethic within the department, that 'the students should not get away with anything,' perseverative behaviour or simply following the experimenter's instructions – increase teacher task talk, other factors remaining constant (ceteris paribus).

Correlations between all teacher task talk (202/220/221) and student on-task behaviour showed increasingly significant relationships over the two cumulative interventions.

Table 5.6.3 Correlation of Teacher Task Talk with Student On-Task Behaviour and Unwanted Behaviour for Baseline and Intervention Conditions

Correlation Of Teacher Task Talk With					
Student On-Task Behaviour And Unwanted		**Samples:**			
Behaviour:		**5419**	**5450**	**5462**	**Significance:**
teacher task talk to target student (220)	with student on task behaviour (301/302/320)	0.091	0.000	-0.081	
all teacher task talk (202/220/221)	with student on task behaviour (301/302/320)	0.251	**0.349**	**0.378**	P< 0.02, P< 0.01
all teacher task talk (202/220/221)	with student unwanted behaviour	-0.171	-0.146	-0.217	

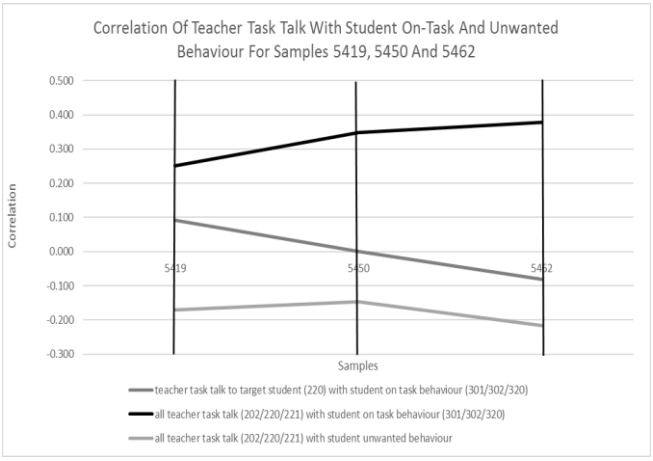


Figure 5.6.10 Correlation of Teacher Task Talk with Student On-Task Behaviour and Unwanted Behaviour for Base-line (5419) and Intervention Conditions (5450 and 5462)

Interestingly, the increase in all teacher task talk is associated in this data with an increasingly negative relationship between teacher task talk to the target student and student on-task behaviour.

The above data is consistent with the hypotheses (Hypotheses $H_{overarching}$, H_1, and H_2) that increasing teacher task talk has the concomitant effect of increasing student on-task behaviour and reducing student unwanted or competing behaviour. The instruction to 'as much as possible respond to all unwanted or competing behaviour with a task/work related response' (Intervention 2) had a positive incremental effect. This is unsurprising as 'running' a task related narrative is more practicably effected than selective attention or 'planned ignoring' and retains the focus personally and publicly on-task.

Summary and Discussion

The above data (figures) show that the increasing the rate of teacher task talk, the greater rates of on-task behaviour and lesser rates of competing behaviour will be realised and that this effect will be enhanced the more comprehensive this focus. Further that this effect can be realised during the transient stage when teacher task talk is less than 50% of available time.

These results are consistent with the hypotheses stated: a high rate of teacher task talk would be associated with a high rate of student on-task behaviour. High rates of teacher task talk are both discriminative stimuli for gaining and maintaining task orientation, are prescriptive or defining of the contingency operating for student attention and behaviour (Hypothesis H_1); and that a high rate of teacher task talk would be associated with reduced rates of student unwanted or competing behaviour. Competing or unwanted behaviour, such as talking with peers, would be expected to be more manifest in this 'void' of lesser teacher task talk (Hypothesis $H_{2)}$.

These results are also consistent with those of Lane (1999, 2001) showing that increasing student engagement reduces disruptive behaviour.

In his summary of the literature, Church (2003, p.111) stated, "The instructional systems that have been found to be most effective, not only in maintaining student interest but also in fostering the learning of at-risk students, all involve fairly fast-paced classroom activities," .. this, plus increasing the "level of active responding results in a marked reduction in the disruptive behaviour rate of both low decile students and students with behaviour difficulties." (p. 111). Whilst not directly comparable with the findings of the current study, Church's summary does extol similar parameters – maintaining a high rate of teacher task talk.

Similar and related findings have been presented by Ayllon, and Roberts (1974), Lindsley (1992), Sutherland and Wehby (2000), Frey, Hirschstein, & Guzzo (2000), and Sutherland, Alder and Gunter (2003).

The current study goes beyond what has been a tendency in the research to focus on those specific aspects of teaching practice related to problem behaviour.

The focus is on the classroom context, on those factors that relate to student engagement which are pre-and co-requisite to academic achievement. Effecting greater teacher task talk is simple and does not require especial knowledge and the ability to apply this in a discriminating manner. Curriculum or content knowledge is imperative as is the ability to talk to this in an ongoing manner – this also necessitates planning.

The US Secretary of Education, in a document entitled 'Meeting the Highly Qualified Teacher Challenge' argued that 'verbal ability and subject matter knowledge are the most important attributes of highly qualified teachers….' (US Dept. of Education 2002).

The importance of such a focus is paramount in that teacher effects have repeatedly been shown to be salient in student performance and that these effects transcend socio-economic factors (Rowe and Rowe, 2002).

6 Teacher Verbal Behaviour and Proximity to the Target Student, Summary and Discussion

The information from the previous Sections is ordered into teacher verbal behaviour and proximity to the target student Sections and summarized, such that this can be analysed as the predominant focus. The results are discussed further.

All Figures and Tables represent the mean values for those particular analyses (the mean for year level, Primary School, Intermediate and Secondary Schools, etc. separately). Separate correlation matrices were constructed for each analysis from this averaged data. Each data point represents the average occurrence of that behaviour for that sample.

6.1 Teacher Task Talk

Introduction

"Studies of language behavior in secondary classrooms indicate that the most direct way in which teachers dominate the process of making meaning is that they talk the most" (Collins and Seidman, p.6, 1980).

Descriptive analyses of classroom behaviour have shown that most teacher child interactions are, "neutral … not intended to directly control or manage behavior" (O'Leary & Sanderson, 1990, p. 257), they are instructional sequences or academic talk (Galton, Simon, & Croll, 1980; Shores, 1993; Shores, Jack et al., 1993; Wehby, Symons & Shores, 1995; Wehby & Yoder, 2002). Within the class setting, "Teacher talk is not only dominant, but also regulatory … Teachers in the classrooms we studied do most of the talking. Their talk is most often directed at the entire class and less frequently at individual members of the class … Students' verbal behaviour is much more limited than that of teachers. They are basically responders rather than initiators" (Bellack & Kleibard,1966, p. 6). They found a ratio of teacher talk to learner talk of 3:1. The TIMSS-R video study (1998-2004), looking at grade 8 mathematics classes across seven countries found that teachers,

adjudged ‘to be competent teachers in their respective countries,’ talked at a ratio of at least 8:1 words compared with students.

Atwater and Morris, (1988, p.157) found that “the form of the instruction did not influence the probability of compliance as much as the interaction context in which the instruction was delivered (e.g. children were more likely to comply with an instruction if they were engaged in an activity than if they were off task or disruptive).” Similarly, Fisher et al. (1996) found the effectiveness of verbal attention to be dependent on its content or task relevance. This suggests instructional control to be more than a function of the relationship between the instruction and the contingencies, as proposed by Galizio (1979), Hayes, Brownstein and Kern (1986), Hackenberg and Joher (1994) and Schmitt (1998), but rather a function of the contingency and social context and congruence with this context.

In the writer’s experience, across home, school and institutional settings, the maintenance of attention, application to task and performance (instructional control) are a function of rate rates of teacher task talk. This provides the base and requisite contrast (setting event/establishing operation/discriminative stimuli) upon which praise and reprimands gain their effect. In addition, this enables distractibility, off-task and inappropriate behaviour to be more effectively addressed by task or work related redirection (or talk) as opposed to addressing problem behaviour directly. If teacher (adult) talk is task/activity specific and this focus is frequent, ongoing, and public, this defines the situation, behavioural expectation and performance.

It defines the context of the learning environment. A rate of teacher task talk that has resulted in diminishing returns has not been observed.

Research has not evaluated ‘task talk’ in any but a cursory descriptive manner not in respect to function. The frequency and dispersion (rate) and duration of task talk could be said to be prescriptive in defining the setting event, reinforcement context, teaching relationship and reinforcement for academic performance – providing discriminative stimuli for the maintenance of attention and academic performance, and co-requisite in maintaining this. Additionally, retaining

the teacher as focal within the classroom. Thus, the greater the rate of task talk, the greater rates of performance and lesser rates of competing behaviour will be realised, and that this will be particularly apparent in respect of those children with poor social skills and pre-existing behaviour problems. Contrarily, that low rates of teacher task talk will be associated with (create) lesser rates of on-task behaviour and greater rates of unwanted or competing behaviour. These tenets are supported by findings in Sections 5.1 to 5.5 in the current research.

Results

The results from Sections 5.1 to 5.5 have been summarised to provide an overview of findings regarding teacher task talk within the class and the relation of this with student on-task and unwanted behaviour.

Teacher Task Talk across Year Levels

Table 6.1.1 The Correlation between the Mean Rate (Seconds per Minute) of Teacher Task Talk Severally and Combined and the Mean Rate (Seconds per Minute) of Student On-Task Behaviour across Year Levels

Correlation of Teacher Task Talk With	**Data Points Within Samples:**	44	42	42	39	34	46	55	54	52	54
Student On Task Behaviour (301/302/32	**Sample Size:**	**N=1**	**N=2**	**N=1**	**N=2**	**N=32**	**N=5**	**N=7**	**N=3**	**N=6**	**N=3**
	Year Level:	**Year 2**	**Year 3**	**Year 4**	**Year 5 &**	**Year 7 &**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**
teacher task talk to whole class	202	0.005	**0.528**	0.032	0.284	**0.484**	**0.453**	**0.368**	-0.097	0.037	0.180
teacher task talk to target student	220	0.112	-0.482	**-0.649**	0.057	-0.036	0.156	-0.078	0.126	-0.263	0.063
teacher task talk to other students	221	-0.122	**0.792**	0.109	0.035	-0.196	-0.240	-0.058	**-0.291**	**-0.488**	0.192
all teacher task talk	202/220/221	-0.136	**0.485**	**0.873**	0.285	**0.384**	**0.424**	**0.323**	-0.217	**-0.292**	**0.339**
highlighted numbers P< 0.05 for total sample size (Data Points Within Samples)											

Correlations between teacher task talk to the whole class (202) and all teacher task talk (202/220/221) relate more positively (with respective year rates) with student on-task behaviour than do correlations between teacher task talk to the target student and other students (Table 6.1.1). For correlations within sessions, for years 2, 7, 8, and 10, and 11 (N= 42, 34, 46 and 55, r=0.527, r=0.484, r=0.453, r=0.368, $p<0.01$ respectively). All teacher task talk (202/220/221) correlated positively and significantly for years 2, 3, 7 and 8, 9, 10 and 13. These results show trends (moderate to large relationships and effect sizes) consistent with the expected relationships hypothesised (Hypotheses $H_{overarching}$, H_1, and H_1) regarding the functional nature of teacher task talk.

Teacher task talk to the whole class for years 7 and 8 related moderately (by sessions, N=32, r=0.484. p<0.001) with student on-task behaviour (301/302/320) as did teacher task talk combined (202/220/221, r=0.384, p<0.02). When all intervals were combined (94), in contrast to the truncated data (34 intervals) a large relationship was found (r=0.967, p<0.001).

Table 6.1.2 The Correlation between the Mean Rate (Seconds per Minute) of Teacher Task Talk Severally and Combined and the Mean Rate (Seconds per Minute) of Student Unwanted Behaviour across Year Levels

Correlation of Teacher Task Talk With	**Data Points Within Samples:**	**44**	**42**	**42**	**39**	**34**	**46**	**55**	**54**	**52**	**54**
Student Unwanted Behaviour:	**Sample Size:**	**N=1**	**N=2**	**N=1**	**N=2**	**N=32**	**N=5**	**N=7**	**N=3**	**N=6**	**N=3**
	Year Level:	**Year 2**	**Year 3**	**Year 4**	**Year 5 &**	**Year 7 &**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**
teacher task talk to whole class	202	-0.075	0.123	-0.199	0.304	**-0.548**	**-0.330**	-0.126	0.091	-0.057	0.022
teacher task talk to target student	220	-0.119	-0.087	-0.030	0.033	-0.085	-0.002	0.154	-0.086	0.279	-0.158
teacher task talk to other students	221	**0.311**	0.130	0.184	-0.090	0.334	0.124	0.207	0.192	**0.463**	-0.204
all teacher task talk	202/220/221	0.278	0.032	0.120	-0.349	-0.358	**-0.316**	0.018	0.169	0.267	-0.195
highlighted numbers P< 0.05 for total											
sample size (Data Points Within Samples)											

Table 6.1.2 shows a large negative relationship between teacher task talk to the whole class (202) and student unwanted behaviour across sessions (N= 32, r=0.548, p<0.01). For year 9, moderate negative relationships were obtained within sessions for teacher task talk to the whole class and all teacher task talk combined (N=45), r=-0.330, p< 0.05 and r=-0.316, P 0.05).

The positive relationships found between teacher task talk to other students (221) and student on-task behaviour, rather than spurious, suggest student unwanted or competing behaviour is likely to increase given teacher focus on other students.

Given the small sample sizes, the obtained correlations indicate relationships consistent with the stated hypotheses regarding the functional nature of teacher task talk in the classroom setting. The across session correlations regarding year 7 and 8 (N=32) are more indicative.

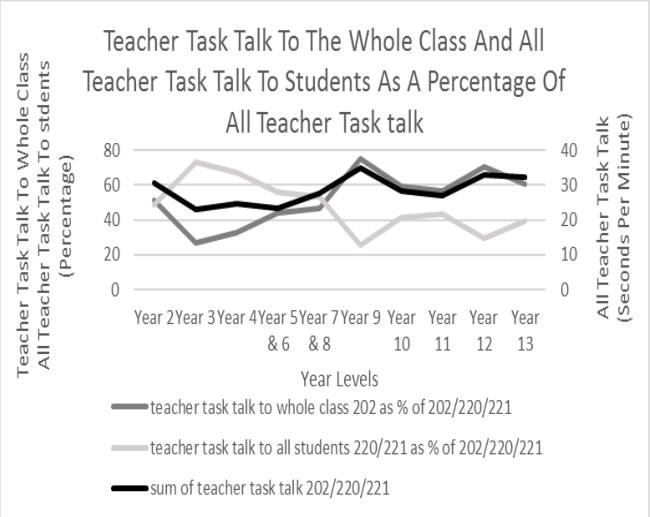


Figure 6.1.1 The Mean Rates (Seconds per Minute) of Teacher Task Talk to the Whole Class and to all Students as a Percentage of the Mean Rate (Seconds per Minute) of all Teacher Task Talk across Year Levels

Figure 6.1.1 shows the 'change over' or transition as evidenced by percentages of teacher task talk to the whole class (202) and all teacher task talk to students (220/221). This indicates that for the earlier years there is a greater emphasis on an individual student focus and after this (year 9 and on) a whole class focus, wherein the percentage of task talk to the whole class (202) becomes very similar to all teacher task talk. This data clearly demarks a change in teaching philosophy from the junior classes at the year levels 7 and 8.

No consistent significant relationships were found between teacher behaviour directed to the target student (teacher praise for work, praise for behaviour, reprimand and behaviour talk) severally or combined and student on-task behaviour (Table 5.1.7, Section 5.1).

No consistent significant relationships were found between teacher behaviour directed to the target student and student unwanted or competing behaviour (Table 5.1.8, Section 5.1).

No significant positive correlations were found across year rates for either teacher praise or teacher reprimands and student on-task behaviour that would indicate a characteristic significant relationship exists.

Moderate positive relationships were found between student on-task behaviour and all teacher task talk (202/220/221) for years 3, 4, 7 and 8, 9, 10, and 13 ($p<0.05$). For year 7 and 8, $r= 0.967$, $p<0.001$ when this is calculated by total number of recorded intervals (94 c.f.34 intervals). Given the variability and small sample size, the trend can be seen as indicative.

Consistent moderate negative relationships were found between all teacher task talk and student unwanted behaviour (year 7 and 8, $r=-0.358$, $p<0.05$) for year rates 5 and 6, 7 and 8, and 9 ($p<0.05$). For year rates 5 and 6 and 12, teacher behaviour talk and reprimand and behaviour talk combined related moderately with student unwanted behaviour.

Indications were that the principal defining parameters of student on-task and student unwanted or competing behaviour were teacher task- related talk combined, that is, to the whole class (202), to the target student (220) and to other students (221).

Teacher Task Talk across Primary Intermediate and Secondary Schools

Teacher task talk to students (220/221 combined) constituted 61.408 per cent of all teacher task talk for Primary School data, 53.404 percent for Intermediate and 32.598 percent for Secondary School data (Table 5.2.2, Section 5.2). The complement, teacher task talk to the whole class (202) increases over Primary, Intermediate and Secondary School, indicating a considerable and relatively greater emphasis on student directed instruction in the earlier years and toward whole class instruction for the older.

No relationships were found between teacher task talk, praise for work, praise for behaviour, reprimands, behaviour talk, social talk addressed to the target child and student on-task behaviour, nor for teacher reprimand and behaviour talk combined and student unwanted or competing behaviour. This is unsurprising as teacher interactions with the target student are minimal, the range for teacher behaviour toward the target student (220/230/240/250/260/270) being 0.008 to 0.75

seconds per minute for Primary School data, 0.01 to 1.06 seconds per minute for Intermediate data, and 0.02 to 1.21 per minute for Secondary School data.

Teacher task talk (220), reprimand (270) and reprimand and behaviour talk (270/230) to the target student, despite not relating significantly to student on-task or unwanted or competing behaviour all showed a negative relationship across year rates. This suggests that teacher task talk directed to an individual student detracts from student task focus, as do reprimands alone and reprimands plus behaviour talk.

Moderate to large positive relationships were found with Intermediate and Secondary School data between all teacher task talk (202/220/221) and particularly with teacher task talk to the whole class (202) and student on-task behaviour ($r= 0.484$, $p<0.01$, and $r= 0.585$, $p<0.001$ respectively). The relationship between all teacher task talk and student on-task behaviour for Primary School data is elevated but not significantly so. This may reflect the relative lower rate (seconds per minute) of teacher task talk to the whole class and teacher task talk combined for that group (9.61 seconds per minute compared with 12.80 and 20.57 seconds for Intermediate and Secondary Schools and 24.91 seconds per minute compared to 27.47 and 30.52 respectively for teacher task talk combined). That is, at a certain rate (seconds per minute) teacher task talk loses the relationship with student on-task behaviour and other factors become prescriptive or defining. The differences between teacher proximity to the target student across Primary, Intermediate and Secondary Schools may also explain the differences, 18.215, 9.509 and 4.536 respectively. Proximity in junior classes reflecting a greater number of students per square meter and this also maintaining the teacher as a significant discriminate stimulus.

Table 6.1.3 The Mean Rate (Seconds per Minute) of Teacher Task Talk Differentiated and Correlations with the Mean Rates (Seconds per Minute) of Student On-Task Behaviour and Unwanted Behaviour for Primary, Intermediate and Secondary Schools

					Correlation With On Task Behaviour:		
Teacher Task Talk (seconds/minute)	**Behaviour Code:**	**Primary:**	**Intermediate:**	**Secondary:**	**N=6**	**N=32**	**N=29**
teacher task talk to whole class	202	9.614	12.801	20.571	0.249	**0.484**	**0.585**
teacher task talk to target student	220	0.750	1.064	1.214	0.055	-0.036	-0.242
teacher task talk to other student	221	14.548	13.607	8.735	-0.040	-0.196	0.030
sum of teacher task talk	202/220/221	24.912	27.472	30.519	0.248	**0.384**	**0.452**

				Correlation with Student Unwanted		
Behaviour:	**Behaviour code:**		**primary data:**	**intermediate data:**	**secondary data:**	
			N=6	**N=32**	**N=29**	
all teacher task talk	202/220/221	seconds/minute	24.912	27.472	30.519	
		incidents/minute	1	1	1	
correlation with student on task	301/302/320	correlation	0.248	**0.384**	**0.452**	
correlation with student unwanted behaviour	330/305/6/7/8/340/350/360	correlation	-0.168	**-0.358**	**-0.556**	

It may also be an artefact of a greater use of group teaching practice (which leaves most the class, those not within group, without oversight for the duration) although group teaching practice was a characteristic of some of the Intermediate classes. The lack of any significant relationships between the respective teacher behaviour and student on-task or unwanted or competing behaviour for Intermediate and Secondary students however questions the presumed advantages of an individual focus, such as group teaching providing greater teacher attention for task.

(Codes: 330/304/305/306/307/308/340/350/360), student unwanted or competing behaviour was less for Primary School students (1.443 seconds per minute) than for students in Intermediate and Secondary Schools (3.308 and 4.299 seconds per minute respectively).

This differential, plus the lack of relationship between teacher task talk to the target child and student on-task behaviour is not consistent with the notion of an individual focus defining student behaviour.

Negative relationships were found between teacher praise for work, teacher reprimands, and teacher social talk across year rates and student on-task behaviour when teacher behaviour was summed for each category (teacher behaviour to the whole class, to the target student and to other students was combined).

Moderate to large relationships were found between teacher task talk (202/220/221, $r=0.45$, $p<0.01$) and student on-task behaviour (301/302/320) for the

Secondary School data and for the Intermediate School data, $r=0.38$, $p<0.05$. This relationship was not repeated for the Primary School data.

A moderate negative relationship ($r=-0.45$, $p<0.02$) was obtained between student on-task behaviour (301/302/320) and teacher praise for work (205/250/251) for the Intermediate School data. Correlations for the other groups do not approximate significant relationships.

Negative relationships were obtained for teacher task talk to the target student and to other children. This indicates that teacher whole class instruction relates more significantly to student on-task behaviour than does a more targeted student direction of task talk.

These data are probably an artefact of group based instruction and when student on-task behaviour is considered, the higher rates for Primary School (51.728 seconds per minute) compared with Intermediate which has some group based instruction and Secondary with no group based instruction (47.284 and 46.662 seconds per minute respectively).

As stated above, student unwanted or competing behaviour was less for Primary School students (1.443 seconds per minute) than for students in Intermediate and Secondary Schools (3.308 and 4.299 seconds per minute respectively).

At a certain rate (seconds per minute) teacher task talk, to the whole class and combined, loses the relationship with student on-task behaviour and other factors become prescriptive or defining of classroom behaviour (such as non-contingent teacher proximity?). Insignificant negative relationships were found for teacher task talk to the target student and to other children combined despite Primary School teacher task talk to all students being higher than for the other school data (Table 6.1.2). Teacher whole-class instruction related significantly to student on-task behaviour whereas a more targeted student direction of task talk, as is the case in Primary Schools, did not.

Inherent in these results is the retention of a classroom task-related focus for all students, the retention of teacher visibility and, hence, teacher behaviour having

a generalised effect as focal to retaining high rates of individual student on-task behaviour, which implicitly reduces rates of unwanted or competing behaviour.

More definitive results could have been realised given further differentiation within the student on-task category, such that student attention was differentiated according to function, such as work-related or social related rather than being all encompassing.

Teacher Task Talk All Data Combined (N=72)

Table 6.1.4 Correlation between the Mean Rates (Seconds per Minute) of Teacher Task Talk Differentiated and the Mean Rates (Seconds per Minute) of Student On-Task Behaviour and Student Unwanted Behaviour for All Data Combined, N=72

Correlation Of Teacher Task Talk With Student On-Task					
Behaviour (N=72).					
Teacher Behaviour:	**Behaviour Code:**	**seconds/minute**	**incidents/minute**	**correlation:**	**significance:**
teacher task talk to whole class	202	15.495	1.000	**0.704**	**P< 0.001**
teacher task talk to the target student	220	1.048	1.000	**-0.364**	**P< 0.01**
teacher task talk to other students	221	11.090	1.000	**-0.381**	**P< 0.01**
all teacher task talk	202/220/221	27.633	1.000	**0.454**	**P< 0.001**
Correlation Of Teacher Task Talk With Student Unwanted					
Behaviour (N=72).					
Behaviour:	**Behaviour code:**	**seconds/minute**	**incidents/minute**	**correlation:**	**significance:**
student unwanted or competing behaviour	330/304/5/6/7/8/340/350/360	3.386	1.000	1	
teacher task talk to whole class	202	15.495	1.000	**-0.572**	**P< 0.001**
teacher task talk to target student	220	1.048	1.000	0.156	
teacher task talk to other students	221	11.090	1.000	0.232	
all teacher task talk	202/220/221	27.633	1.000	**-0.499**	**P< 0.001**

Teacher task talk (Table 6.1.4) to the whole class and all teacher task talk combined showed moderate to large relationships with both student on-task behaviour ($r=0.704$, $p<0.001$, $r=0.454$, $p<0.001$) and student unwanted or competing behaviour ($r=-0.572$, P0.001, $r= -0.499$, $p<0.001$). Teacher task talk targeted at the individual student (220) moderately and negatively with student on-task behaviour ($r=-0.364$, $p<0.01$) and positively but insignificantly with student unwanted behaviour ($r=0.156$).

These relationships (consistent with Sections 5.1 and 5.2) indicate a class wide focus to be more effective in maintaining student on-task behaviour and in reducing student unwanted behaviour than an individual focus. Further, that teacher task talk targeted at the target student is negatively related to student on-task behaviour.

Moderate to large negative relationships were found between teacher task talk to the whole class (202) and teacher reprimands and behaviour talk to the target student (270/230), r=-0.336, p<0.01; between teacher task talk to other students (221) and teacher reprimands and behaviour talk to the whole class (207/203), r=-0.374, p<0.01; between teacher task talk to other students (221) and all teacher reprimands and behaviour talk, r=-0.382, p<0.01; between all teacher task talk (202/220/221) and all teacher reprimands and behaviour talk (207/203), r=-0.434, p<0.001, and between all teacher task talk (202/220/221) and all teacher reprimands and behaviour talk (207/203/270/230/271/231), r=-0.480, p<0.001.

These results indicate that increased rates of teacher task talk are concomitantly associated with a decrease in teacher reprimand and behaviour talk, and significantly so.

Teacher task talk combined and to the whole class are functionally related to, indeed basic to, the maintenance of an effective learning environment.

Teacher Task Talk for One Student and Two Teachers

In the current study (Section 5.4), one teacher used an individual focussed attention for work and reprimand approach (teacher 2004), the other (teacher 2005) a whole class focus and avoidant approach. The latter was more effective in realising less unwanted behaviour, greater on-task behaviour and with the remaining in class for a considerably longer period of time.

Despite the diminishing rates of teacher task talk to the whole class and combined, and student on-task behaviour for both teachers, a large overall relationship between teacher task talk to the whole class and student on-task behaviour, r=0.549 (p<0.001) was retained for teacher 2005. This was associated with a better overall outcome. This result is consistent with the large relationship found for the Intermediate data for all intervals (r=0.967, p<0.001) which was associated with both a reduction in teacher task talk and student on-task behaviour.

Teacher 2004 focussed on the target child, gave greater attention (task talk) to task, had greater congruity of reprimand with unwanted behaviour, albeit showed greater and increasing attention to unwanted or competing behaviour and

decreasingly to student on-task behaviour with a resultant rate of 26.20 seconds per minute.

Maintenance of the relationship between teacher task talk to the whole class with lesser interaction with the target student (teacher 2005) maintained better on-task behaviour (45.06 seconds per minute).

The different management styles with the one class are salient and indicative of the behavioural contrast in the student's behaviour and the consequent high level of teacher 2004's rate of ineffective reprimand.

These results could be seen as expected given attention-seeking behaviour, however given the above findings that teacher behaviour directed to the target student has little, or a negative, relationship with student on-task and unwanted behaviour relative to teacher behaviour directed to the whole class or combined, more general conclusions appear more appropriate – that a class wide focus is more effective in maintaining on-task behaviour and reducing student unwanted behaviour than an individual focus. That teacher task talk to all targets combined has a greater relationship with student on-task and unwanted behaviour than does individually directed talk.

Numerous researchers have found teacher behaviour to be variably discriminative and avoidant of student problem behaviour. For example, Van Acker, Grant and Henry, (1996). Carr, Taylor and Robinson (1991, p. 523) found that "adults engaged in teaching activities with non-problem children more often than with problem children … when an adult worked with a problem child the breadth of instruction was more limited (fewer task demands were presented) and typically involved those tasks associated with lower rates of problem behaviour. … Students learned that demonstrating undesirable behaviours allow them to avoid instruction," (Carr et al., 1991, p.524).

In the current study, teacher avoidant behaviour of the target student, whilst continuing a class wide focus, has effected greater on-task behaviour than a student focused approach.

The point of excluding the student from class reflects the different management styles. For teacher 2004, management consisted of target student directed task talk and reprimand more than the mean of what was delivered to other students. At the point (or near) at which reprimand and behaviour talk exceeded task talk he was dismissed. For teacher 2005 management involved minimal individual (personal) interaction and whole class instruction or task talk. At the point (or near) of unwanted or competing behaviour exceeding teacher task talk to the whole class, the student was dismissed.

Teacher Task Talk for Those Teachers Having Expressed Classroom Management Difficulty (N=17), and The Remainder (N=53)

All teacher task talk (202/220/221) for N=53 is 1.36 times more than N=17. The teacher focus on 'wanted' behaviour (on-task related behaviour) in sample N=53 is considerably greater than in N=17, and the focus on 'unwanted' behaviour considerably less.

In both samples, teacher verbal behaviour aside from all teacher task talk (202/220/221) is directed toward the target student and other students more than to the whole class. With respect to teacher task talk, 40.27% in N=17 is directed toward the target student and other students, for N=53, 44.78% is. This differential is constituted of the difference between teacher task talk to the whole class (202). In N=53 this constitutes 59.71% of all teacher task talk (202/220/221,) and for N=17, 55.21%.

This indicates a greater relative focus of teachers in N=53 with students on-task behaviour.

Table 6.1.5 Correlation between the Mean Rates (Seconds per Minute) of Student On-Task Behaviour and Student Unwanted Behaviour and the Mean Rates (Seconds per Minute) of Teacher Task Talk Differentiated and Combined for N=17 and N=53

Behaviour:	**Code:**	**Correlation With Student On Task Behaviour:**			
		N=17	**N=53**	**Significance:**	
teacher task talk to whole class	202	0.184	**0.600**	P< 0.001	
teacher task talk to target student	220	0.047	**-0.332**	P< 0.02	
teacher task talk to other	221	0.021	**-0.341**	P< 0.02	
sum of teacher task talk	202/220/221	0.328	**0.382**	P< 0.01	
		Correlation With Student Unwanted Behaviour:			
		N=17	**N=53**	**Significance:**	
teacher task talk to whole class	202	-0.195	**-0.545**	P< 0.001	
teacher task talk to target student	220	-0.004	0.142		
teacher task talk to other students	221	-0.030	**0.330**	P< 0.02	
all teacher task talk	202/220/221	-0.343	**-0.374**	P< 0.01	

Correlations (Table 6.1.5) were all higher for teacher task talk directed toward the whole class compared to teacher task talk combined and task talk directed to the individual (target) student (220).

Table 6.1.6 The Mean Rates (Seconds per Minute) of all Teacher Praise, Reprimands and Behaviour Talk, Task Talk, Student On-Task Behaviour and the Mean Rate (Seconds per Minute) of Student Unwanted Behaviour (Seconds per Minute) for Teachers Describing Management Difficulties (N=17) and those not Describing such Difficulty (N=53).

Behaviour (Seconds Per Minute):	**Behaviour Code:**	**N=17**	**N=53**
		seconds per minute	seconds per minute
student on task behaviour	301/302/320	36.241	49.030
all teacher task talk	202/220/221	22.283	30.392
sum teacher reprimand and behaviour talk	207/203/270/230/271/231	4.996	1.739
all teacher praise	205/50/51/206/60/61	1.088	1.194
student unwanted or competing behaviour	330/305/6/7/8/340/350/360	6.975	2.363

Incidents per minute for all the above behaviour was 1, i.e. the behaviour occurred in every interval (Table 6.1.6). No relationships were found between teacher task talk severally or combined and student on-task behaviour for those teachers who had expressed difficulty (N=17). Large positive relationships and effect sizes were found between teacher task talk to the whole class (202, $r=0.600$, $p<0.001$)) and student on-task behaviour (301/302/320) indicating a stronger relationship between these two variables than for the sum of teacher task talk with student on-task behaviour (301/302/320, $r=0.382$, $p<0.01$) for those teachers who had not expressed difficulty N=53. The moderate negative relationships between teacher task talk to the target student (220, $r=-0.332$, $p<0.02$) and to other students (221, $r=-0.341$, $p<0.02$) and student on-task behaviour (301/302/320) indicate that

this direction of teacher task talk does not add incrementally to overall student on-task behaviour. This probably reflects a distraction effect for both.

The above results indicate that teacher task talk combined (202/220/221), and particularly teacher task talk to the whole class (202), are more substantially related to student on-task behaviour than is evidenced by an individual focus (220). The latter relationships (220 and 221), suggesting an individual focus to be detracting of student on-task behaviour.

For sample N=53, a large negative relationship was found between teacher task talk to the whole class (202, $r=-0.5445$, $p<0.001$) and moderate relationship for all teacher task talk (202/220/221, $r=-0.374$, $p<0.01$) with student unwanted behaviour. These results indicate that a high rate of teacher task talk (greater than 50% of available time in this case) does significantly relate to both student on-task behaviour and student unwanted or competing behaviour (Table 6.1.4). Conversely, that a rate of teacher task talk constituting 37% of available time (N=17) is associated with a loss of those relationships.

No significant relationships were found in sample N=17 between teacher task talk (202/220/221) and unwanted or competing behaviour (330/305/306/307/308/340/350/360, Table 6.1.4 and Figure 6.1.8). Student unwanted or competing behaviour is considerably more variable and of greater rate and is more protracted across intervals than N=53.

Reciprocal Teacher–Student Task Talk

The respective relationships found for reciprocal teacher–student task talk indicate the level of association or congruity between teacher–student and student–teacher task talk for N=17 to be lesser than for N=53 ($r=0.330$ and $r=0.579$, $p<0.001$, respectively).

These results (relative rates and congruence) suggest a greater teacher responsiveness and control over the interactions for N=53 than N=17. That is, with a higher rate of teacher task talk to the whole class and combined.

Teacher task talk to the target student related r=0.046 with student on-task behaviour for N=17 and r=-0.332, p<0.02 for n=53. Relationships with student unwanted or competing behaviour were r=-0.004 for N=17 and r=0.142 for N=53. Neither result indicate reciprocal task talk to contribute significantly to overall student on-task behaviour or student unwanted behaviour.

In the current study, reciprocal teacher–student task talk can be seen as approximating 'opportunities (for the student) to respond' which by this assessment has not added positively, indeed it has detracted from student on-task behaviour.

Summary and Discussion

The following tables show a summary of the correlations between teacher task talk across all data differentiated.

Table 6.1.7 Correlations between the Mean Rates (Seconds per Minute) of Teacher Task Talk to the Whole Class (202) and Combined (202/220/221) and the Mean Rate (Seconds per Minute) of Student On- Task Behaviour (301/302/320) for all Data Differentiated

Correlation Between Teacher Task Talk and Student			202		202/220/221	
On -Task Behaviour:		N =	correlation, r =	significance, P<	correlation, r =	significance, P<
301/302/320	all data	72	**0.719**	**0.001**	**0.704**	**0.001**
	Primary school data	6	0.149		0.248	
	Intermediate school data	32	**0.484**	**0.01**	**0.385**	**0.05**
	Secondary school data	29	**0.585**	**0.01**	**0.452**	**0.05**
	teachers having difficulty (N=17)	17	0.184		0.328	
	teachers not expressing difficulty	53	**0.600**	**0.001**	**0.382**	**0.01**
	N=53 truncated to 22 intervals	53	**0.374**	**0.01**	**0.525**	**0.001**

Table 6.1.8 Correlations between the Mean Rate (Seconds per Minute) of Teacher Task Talk to the Whole Class and Combined (202/220/221) and the Mean Rate (Seconds per Minute) of Student Unwanted Behaviour for all Data Differentiated and Combined

Correlation Between Teacher Task Talk And Student		Sample Size:	202		202/220/221	
Unwanted Or Competing Behaviour:		N =	correlation, r =	significance, P<	correlation, r =	significance, P<
330/305/6/7/8/340/350/360	all data	72	**-0.572**	**0.001**	**-0.499**	**0.001**
	Primary school data	6	-0.350		-0.070	
	Intermediate school data	32	**-0.550**	**0.01**	**-0.360**	**0.05**
	Secondary school data	29	**-0.670**	**0.001**	**-0.550**	**0.01**
	teachers having difficulty (N=17)	17	-0.195		-0.343	
	teachers not expressing difficulty	53	**-0.545**	**0.001**	**-0.374**	**0.01**
	N=53 truncated to 22 intervals	53	**-0.353**	**0.02**	**-0.514**	**0.001**

The obtained data indicate that teacher task talk to the whole class and combined are definitive of both student on-task behaviour and student unwanted

behaviour. The correlations for N=53 for the complete and truncated data for teacher task talk to the whole class (202) and teacher task talk combined (202/220/221) reverse indicating a considerable 'swing' to whole class directed task talk after 22 intervals.

Table 6.1.9 Correlations between the Mean Rate (Seconds per Minute) of Teacher Task Talk to the Whole Class (202) and the Mean Rates (Seconds per Minute) of Student On-task Behaviour (301) and Student Unwanted Behaviour for Primary, Intermediate and Secondary Schools

Teacher task talk to whole class (202)		Primary	Intermediate		Secondary		All data		N=17	N=53	
student on-task behaviour (301)	202 with on-task (301)	0.251	**0.534**	P<0.01	**0.515**	P<0.01	**0.719**	P<0.001	0.314	**0.599**	P<0.001
student unwanted behaviour	202 with unwanted behaviour	0.003	**-0.548**	P<0.01	**-0.674**	P<0.001	**-0.572**	P<0.001	-0.195	**-0.545**	P<0.001

Removing student task talk to the teacher (302) and other students (320) and correlating with teacher task talk to the whole class alone (202), teacher task talk that was public (large relationships and effect sizes (figure 6.1.9) resulted in equivalent findings to those depicted in Tables 6.1.7 and 6.1.8 where student on-task behaviour included those behaviours (301/302/320). This data clearly shows strong positive relationships between teacher task talk to the whole class and student on-task behaviour and negative relationships with student unwanted behaviour, particularly the more that teacher task talk is of a public nature (is accessible to the target student). The same relationships are not apparent regarding those teachers that reported management difficulties and for Primary School. The latter anomaly may be an artefact of the 'reprimand-rich' nature of those classes and higher rates of teacher proximity.

Within the class setting, "Teacher talk is not only dominant, but also regulatory … Teachers in the classrooms we studied do most of the talking. Their talk is most often directed at the entire class and less frequently at individual members of the class … Students' verbal behaviour is much more limited than that of teachers. They are basically responders rather than initiators" (Bellack & Kleibard,1966, p. 6). The results from the current study indicate that teacher task talk to be functionally related to both student on-task and unwanted behaviour.

The tenet, that 'In the writer's experience, across home, school and institutional settings, the maintenance of attention, application to task and performance (instructional control) are a function of rate rates of teacher task talk. If teacher (adult) talk is task/activity specific and this focus is frequent, ongoing,

and public, this defines the situation, behavioural expectation and performance. It defines the context of the learning environment … 'if you focus on what you want, you are more likely to get it.' A rate of teacher task talk that has resulted in diminishing returns has not been observed. This enables distractibility, off-task and inappropriate behaviour to be better addressed by task or work-related redirection as opposed to addressing problem behaviour directly.'

The frequency and dispersion (rate) and duration of task talk could be said to be prescriptive in defining the setting event, reinforcement context, teaching relationship and reinforcement for academic performance – providing discriminative stimuli for the maintenance of attention and academic performance, and co-requisite in maintaining this. The results do not indicate reciprocal teacher–student task talk to contribute significantly to overall student on-task behaviour or student unwanted behaviour as has been stated in the research (Haydon et al, 2009; Partin et al, 2010).

In the current study, teacher task talk to the whole class and combined, relates significantly to both student on-task and unwanted behaviour and this considerably more so than any individually targeted teacher behaviour. The latter indicates an individual focus to be deleterious to student on-task behaviour.

These results indicate that task talk is focal in maintaining classroom control and student on-task focus, it is fundamental in maintaining a learning environment. Indications are that teacher task talk greater than 50% of available time to be pivotal in this. A rate of teacher task talk constituting 37% of available time (N=17) is associated with a loss of those relationships.

The results from Section 5.6 (Case Study), show that by increasing the rate of teacher task talk, greater rates of on-task behaviour and lesser rates of competing behaviour will be realised and that this will be enhanced the more comprehensive this focus. Further that this effect can be realised during the transient stage when teacher task talk is less than 50% of available time. The increase in all teacher task talk is associated in this data with a significant positive relationship with student on-task behaviour and elevated negative relationship with student unwanted

behaviour, and an increasingly negative relationship between teacher task talk to the target student and student on-task behaviour.

These results have implications for classroom management in general, the focus of intervention programming and the advocacy for smaller class sizes. Indications are that management involving a greater focus on individual students, would make management issues more manifest.

The Hypotheses stating that:

(Hypothesis $H_{1)}$ A high rate of teacher task talk would be associated with a high rate of student on-task behaviour**.** High rates of teacher task talk are both discriminative stimuli for students gaining and maintaining task orientation, and are prescriptive or defining of the contingency operating for student attention and behaviour. *This would be evident in a significant positive correlation between the independent variables, the rate of teacher task talk to the whole class (202) and combined (202/220/221) and the dependent variable, student on-task behaviour (301/302/320).*

The results in this section strongly support this hypothesis and Hypothesis H_2.

(Hypothesis H_2) A high rate of teacher task talk would be associated with reduced rates of student unwanted or competing behaviour. Competing or unwanted behaviour, such as talking with peers, would be expected to be more manifest in the 'void' created by less teacher task talk. *This would be evident in a significant negative correlation between the independent variable, teacher task talk to the whole class (202) and combined (202/220/221), and the dependent variable, student unwanted or competing behaviour.*

6.2 Teacher Praise for Work and Behaviour

Introduction

Beaman and Wheldall (2000), summarising descriptive analyses into teachers' use of approval and disapproval in the classroom, concluded, "There is little evidence to suggest that teachers, universally, systematically deploy contingent praise as positive reinforcement despite the considerable literature testifying to its effectiveness. In particular, praise for appropriate classroom social behaviour is only rarely observed." (p. 431).

Teacher praise has been shown to be correlated with student on-task behaviour (Apter, Arnold & Stinson, 2010) with increasing academic performance and decreasing problem behaviour (Gable, Hester, Rock & Hughes, 2009). The continued reported low rates of the occurrence of praise is seen as the failure of the adoption of research findings to the teaching profession and additionally as criticism of that profession (Shores, et al, 1993; Sutherland, Wehby & Yoder, 2002).

Similar sentiments have been expressed previously by Strain, Lambert, Kerr, Stagg and Lenkner, (1983) stating that in the ten years preceding their descriptive analysis that hundreds of (functional analysis) studies had shown social reinforcement (praise) to be effective at improving social and academic performance. This belief has resulted in some authors endeavouring to condition praise as a reinforcer (Dozier, Iwata, Thomason-Sassi, Worsdell & Wilson, 2012).

Teacher praise has been found to be most effective when it is behaviour or task specific **(**Kirby & Shields, 1972; Gable & Shores, 1980; Fisher, Ninness, Piazza & Owen-DeShryver, 1996; Sutherland, Wehby & Copeland, 2000), and as reinforcement specific to academic behaviour has been found to reduce or eliminate behaviour problems (Ayllon & Roberts, 1974; Hundert, Bucher & Henderson,1976; Hay, Hay & Nelson, 1977; Gunter, Jack, Shores, Carrell & Flowers, 1993; Lane, 1999, Gable, Hester, Rock & Hughes, 2009,).

Despite the claim as to the greater effect of task-specific praise, Anderson, Everton and Brophy (1979) found less than 5% of teacher praise to be behaviour specific. This, however, is also not well-established. Polick, Carr, & Hanney, (2012) found only minimal advantages of descriptive praise over general praise, the incremental effects of which (on 'teacher efficiency') dissipated over time.

This scenario has not, and is not, as definitive as many studies have suggested. Roberts, Hatzenbuehler and Bean (1981) found with 32 preschool children that contingent attention resulted in decreasing compliance ratios. Roberts (1985) found that following compliance training, previously non-compliant children remained compliant after the withdrawal of the contingent praise.

Within home settings it has been found that, "Neither parent positive behaviour in general (Doleys, 1976; Forehand, Roberts, Doleys, Hobbs & Resick, 1976) nor parent positive reinforcement for appropriate behaviour (Patterson, 1982) differs significantly between parents of conduct disordered clinic-referred children and non-clinic children" (Forehand, 1987, p. 21). He concluded that, "Positive reinforcement is not sufficient to achieve or maintain behaviour change in deviant children … Praise was not discriminative of differences, mentoring or supervision was." (p.21)

Cannella, O'Reilly and Lancioni (2006) in their literature review noticed a "shift away from aversive interventions in the last ten years" (p. 529). This trend towards non-aversive treatment of behaviour problems has gained momentum over time although still has both proponents (LaVigna & Donnellan, 1986; LaVigna, Negri-Shoultz & Fassbender, 1988) as well as detractors for such a singular approach (Lerman & Vorndran, 2002).

In their review of the literature which included forty-one studies of children ranging in age from 1 1/2 to 11 years, Owen, Slep and Heyman, (2012) found praise and positive nonverbal responses resulted in variable outcomes. 'The effect of praise appears to be less immediate than the effect of reprimand, as evidenced by the lack of a consistent connection between praise and compliance in the literature. They concluded that observational studies of the relationship between praise and compliance in both clinical and nonclinical samples have not demonstrated a

reliable link between the two variables (Befera & Barkley 1985; Kuczynski et al., 1987).'

As Brophy, (1981, p.27) pointed out, "Rather than just assume its effectiveness, teachers who wish to praise effectively will have to assess how individual students respond to praise." This tenet is central to functional behaviour analysis. The failure to assess the effectiveness of praise in respect to 'reinforcer effectiveness' and assuming equivalence (i.e. implicitly praise is a reinforcer) and context, has resulted in a bleak picture being painted of the teaching profession. This more so as an artefact of the focus of functional analyses being on problem behaviour. Often this occurs in a situation in which neither praise nor reprimands contingent or contiguous with wanted or unwanted behaviour have a reliable effect in the expected direction, or at all (Fisher, Ninness, Piazza & Owen-DeSchryver, 1996). Variability in response to praise and reprimands is well reported (Piazza, Bowman, Contrucci, Delia, Adelinis & Goh, 1999; Moore 2003; Erickson, Stage, Scott and Nelson, 2006).

Brophy (1981) stated that 'trying to use praise as a systematic reinforcer in a classroom setting is impractical. Even if teachers were able to praise frequently and systematically, say once every 5 minutes, the average student would still be praised less than once every 2 hours' (p. 31).

Green and Lepper (1974) found that once teachers began praising preschool children for doing something they were already motivated to do; the children became less motivated to do the activity.

Praise by its very nature is intrusive and if general praise, it is not necessarily aligned with the target behaviour in the sense of perpetuating the frequency or quality of its occurrence. More protracted praise, as is inherent in behaviour specific praise, is implicitly intruding more substantially on on-task behaviour. In the current study praise is seen as having a similar effect to reprimand in that it initially stops the prior behaviour and what transpires thereafter is dependent on the rate of teacher task talk.

Significant correlation with on-task behaviour really can only be, given student attention is on the teacher at that time and such attention is recorded as student on-task behaviour – at the very least courtesy would demand that student attending would be the most probable response the shorter the observation interval. It would be likely to be recorded as on-task behaviour. Longer observation intervals would be most likely to discern the longer-term effect on student on-task behaviour, as is case in current study.

Overall rates of student on-task behaviour are such that discriminating when to praise or not, and to execute this in a way that is meaningful to the student and ensures equitability of distribution (student on-task behaviour is the predominant student behaviour within the classroom setting) is a daunting if not impossible activity. As Brophy (1981) says, 'Typically, such praise is used infrequently, without contingency, specificity, or credibility' (pp. 5–32). Anderson, Everton and Brophy (1979) found less than 5% of teacher praise to be behaviour specific however, it needs to be behaviour specific to differentiate its referents from the predominant activity – student on-task behaviour.

Fine discriminations in the literature (e.g. Polick, Carr, & Hanney, 2012) are unlikely to provide any more than interesting phenomena given natural frequencies of praise that are so low.

Unwanted behaviour is not comparable, it is of less frequent occurrence, more readily discriminable, as it is often intruding and competing with wanted or on-task behaviour.

Gunter, Ellis, De Briere and Wehby (1993) looking at both regular classrooms and special education classes found praise rates in the former to be 1.2/hr, and for special education classes 4.5/hr. Praise for compliance constituted 2% of the total time. In classes of children with emotional and behavioural disorders (EBD) Shores, Jack, Gunter, Ellis, De Briere and Wehby (1993) recorded praise statements of 1 per hour. Students with aggressive histories received 6–20 times more negative consequences from teachers than non-EBD or non-aggressive EBDs. In similar classes Wehby, Symons and Shores (1995) found praise rates of between 0.02 and 0.04 per hour. Given such low rates, praise can readily become

disingenuous given an increase in rate, and certainly anyone who has been involved in classrooms will be aware of the uncharacteristic disingenuous imposition of praise due to student response to it, and poor timing of its execution, all due to the presence of an observer. Presenting well is paramount in respect to most people – how they perceive other people perceive them. Similarly, current day demand characteristics on teachers often result in the decrease in reprimands, greater involvement with students, greater mobility, etc. given any external visibility or scrutiny.

In the current study, teacher praise was expected to be of low rate, and correlation with on-task behaviour to be a function of the rate of teacher task talk , this is not supported by the data.

A high rate of teacher task talk would be associated with a high rate of student on-task behaviour and with praise being significantly related to both variables. *This would be evident in a significant positive correlation between teacher praise and student on-task behaviour given a high rate of teacher task talk. That is a conditional functional relationship* (Hypothesis H_4)..

Results

Teacher Praise across Year Levels

Across year rates teacher interaction with a (the target) student was found to be minimal. If the greater occurrence of such in the current study is considered, year rates 7 and 8: teacher task talk and praise for work combined is 1.127 seconds per minute; teacher reprimands and behaviour talk combined is 0.189 seconds per minute; teacher social talk, 0.03 seconds per minute; and teacher praise (for work and behaviour) combined is 0.077 seconds per minute.

Teacher praise for work occurred between 0 and 0.063 seconds per minute and praise for behaviour between 0 and 0.064 seconds per minute that was directed toward the target student

Table 6.2.1 The Mean Rates (Incidents and Seconds per Minute) of Teacher Praise for Work, for Behaviour, Reprimands and Behaviour Talk Severally and Combined Directed toward the Target Student across Year Levels

Teacher Praise For Work And Behaviour						**Incidents Per Minute:**					
And Reprimands And Behaviour Talk:	**Behaviour Code:**	**year 2**	**year 3**	**year 4**	**year 5 & 6**	**year 7 & 8**	**year 9**	**year 10**	**year 11**	**year 12**	**year 13**
teacher praises work of target student	250	0	0.024	0.148	0	0.823	0.108	0.2	0.074	0.135	0.074
teacher praises behaviour of target student	260	0	0.048	0	0.025	0.353	0.022	0.145	0.055	0.077	0.018
teacher praise for work and behaviour	250/260	0	0.072	0.148	0.025	1.176	0.13	1	0.129	0.212	0.092
teacher behaviour talk to target student	230	0.045	0	0	0	0.765	0.065	0.145	0.037	0.173	0
teacher reprimands target student	270	0.668	0.024	0.037	0	0.706	0.217	0.363	0.037	0.192	0
reprimand and behaviour talk to target student	230/270	0.713	0.024	0.037	0	1.471	0.282	1	0.074	0.365	0
Teacher Praise For Work And Behaviour					**Seconds Per Minute:**						
And Reprimands And Behaviour Talk:	**Behaviour Code:**	**year 2**	**year 3**	**year 4**	**year 5 & 6**	**year 7 & 8**	**year 9**	**year 10**	**year 11**	**year 12**	**year 13**
teacher praises work of target student	250	0	0.012	0.143	0	0.063	0.026	0.053	0.055	0.012	0.049
teacher praises behaviour of target student	260	0	0.024	0	0.013	0.014	0.004	0.064	0.037	0.048	0.012
teacher praise for work and behaviour	250/260	0	0.036	0.143	0.013	0.077	0.03	0.117	0.092	0.06	0.061
teacher behaviour talk to target student	230	0.068	0	0	0	0.116	0.017	0.032	0.125	0.356	0
teacher reprimands target student	270	0.182	0.012	0.024	0	0.073	0.117	0.147	0.023	0.082	0
reprimand and behaviour talk to target student	230/270	0.25	0.012	0.024	0	0.189	0.134	1.88	0.148	0.438	0

This information, teacher praise for work and behaviour to the target student, is more clearly depicted in Figures 6.2.1 and 6.2.2.

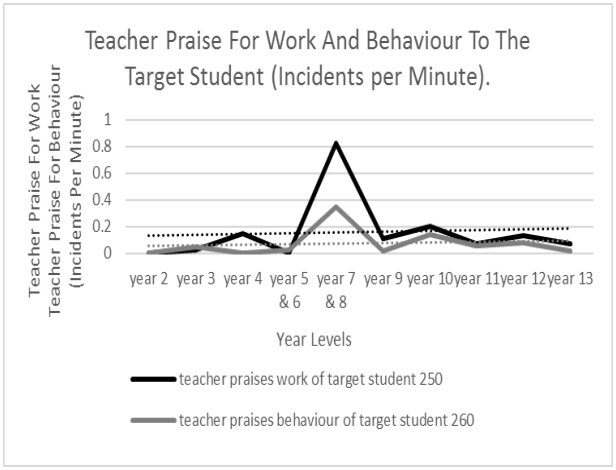


Figure 6.2.1 Mean Rates (Incidents per Minute)of Teacher Praise for Work and Behaviour (250/260) and Mean rates of Teacher Reprimand and Behaviour Talk (230/270) Combined (Incidents per Minute) with Trend Lines across Year Levels

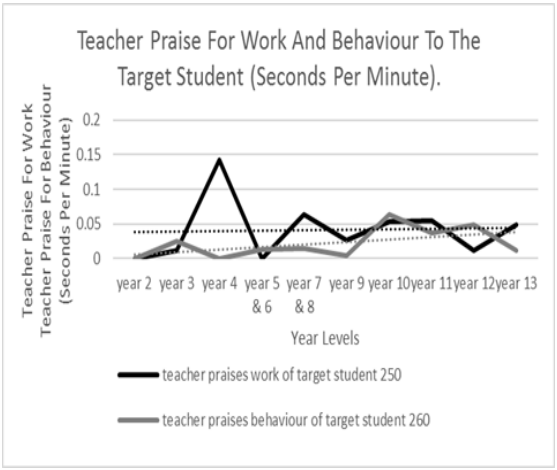


Figure 6.2.2 Mean Rates (Seconds per Minute) of Teacher Praise for Work and Behaviour (250/260) and Mean Rates of Teacher Reprimand and Behaviour Talk (230/270) Combined (Seconds per Minute) with Trend Lines across Year Levels

Figure 6.2.1 and 6.2.2 show teacher praise for work and behaviour differentiated to the target student, incidents and seconds per minute respectively. Praise for work mostly is greater than praise for behaviour. The trend lines indicate both praise for work and praise for behaviour increasing over year level albeit the incidence and rate relating to the target student are minimal.

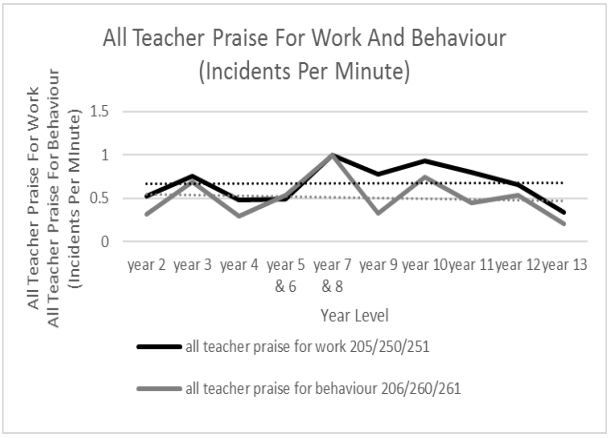


Figure 6.2.3 The Mean Rate (Incidents per Minute) of All Teacher Praise for Work and Mean Rates of Praise for Behaviour Differentiated (Incidents per Minute) across Year Levels

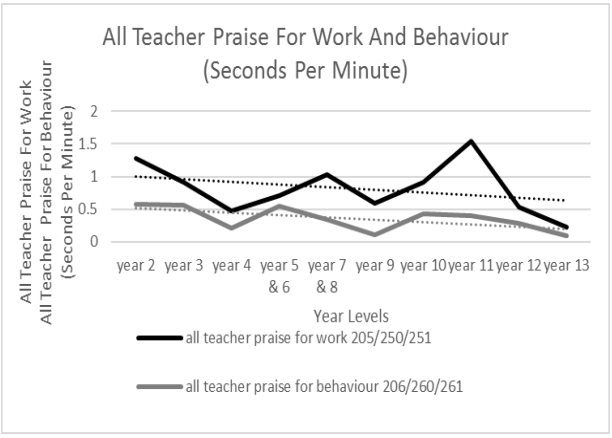


Figure 6.2.4 The Mean Rate (Seconds per Minute) of All Teacher Praise for Work and Mean Rates of Praise for Behaviour Differentiated (Seconds per Minute) across Year Levels

Figures 6.2.3 and 6.2.4 show all teacher praise (to the whole class,to the target student, and to other students) for work and behaviour differentiated. Up until years 7 and 8 the incidents per minute for both are equivalent, all teacher praise for work occurring consistently more from years 7 and 8 on. Seconds per minute of the respective behaviour shows all teacher praise for work consistently greater than all praise for behaviour across all year rates.

Table 6.2.2 Mean Rates (Incidents and Seconds per Minute) of All Teacher Praise, Reprimands and Behaviour Talk, Student On-Task Behaviour and Unwanted Behaviour across Year Levels

Behaviour:		**Incidents Per Minute:**			**Year Level:**						
	Code:	**year 2**	**year 3**	**year 4**	**year 5&6**	**year 7&8**	**year 9**	**year 10**	**year 11**	**year 12**	**year 13**
all teacher praise	205/250/251/206/260/261	0.636	0.881	0.593	0.744	1	0.891	0.964	0.815	0.788	0.463
reprimands and behaviour talk	207/203/270/230/271/231	0.545	0.833	0.444	0.641	1	0.935	0.982	0.926	0.885	0.315
student unwanted behaviour	330/305/6/7/8/340/350/360	0.386	0.238	0.167	0.641	1	0.783	1	0.870	0.808	0.704
student on task behaviour	301/302/320	0.977	1	1	1	1	1	1	1	1	1
Behaviour:	**Code:**	**Seconds Per Minute:**			**Year Level:**						
all teacher praise	205/250/251/206/260/261	1.841	1.476	0.690	1.244	1.368	0.686	1.353	1.944	0.805	0.318
reprimands and behaviour talk	207/203/270/230/271/231	2.409	2.714	1.393	1.538	2.478	2.302	2.903	2.957	2.288	0.414
student unwanted behaviour	330/305/6/7/8/340/350/360	4.182	0.488	0.738	1.538	3.309	2.822	5.802	3.605	2.874	2.358
student on task behaviour	301/302/320	44.364	49.560	50.452	53.282	45.219	50.626	48.106	40.514	45.771	48.907
		0.386	0.238	0.167	0.641	1.000	0.783	1.000	0.870	0.808	0.704

Table 6.2.2 shows all teacher praise for work combined and all teacher reprimand and behaviour talk combined.

Teacher praise combined ranges from 0.462 incidents per minute to 1 in year 7 and 8. This corresponds with a rate of 0.318 to 1.840 seconds per minute in year 2. All teacher reprimand and behaviour talk 0.315 incidents per minute to 1 for year 7 and 8, and a rate of 0.414 to 2.957 seconds per minute in year 11.

Year level 7 and 8 was greatest in respect to incidents per minute of all teacher praise and reprimand and behaviour talk although this did not correspond with seconds per minute of the respective behaviour.

The dispersion (incidents per minute) of all teacher praise across year rates for the junior classes was greater than teacher reprimands and behaviour talk (Table 1), but when seconds per minute of the combined behaviour is considered the reverse is the case. In respect to graphing the same data (incidents per minute), all teacher praise was greater than all teacher reprimands across junior classes but this was reversed for senior classes (Figure 6.2.5). When the graph represented seconds per minute, all teacher reprimands and behaviour talk exceeded all teacher praise across all year rates (Figure 6.2.6). This is not the impression conveyed by Figure 6.2.5 (incidents per minute).

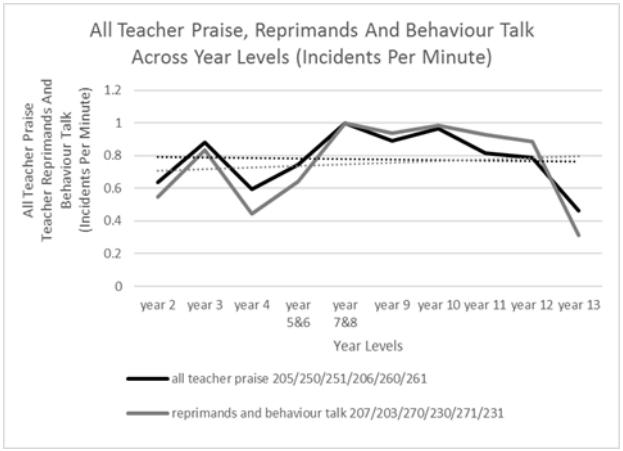


Figure 6.2.5 The Mean Rates (Incidents per Minute) of All Teacher Praise, Reprimands and Behaviour Talk across Year Levels

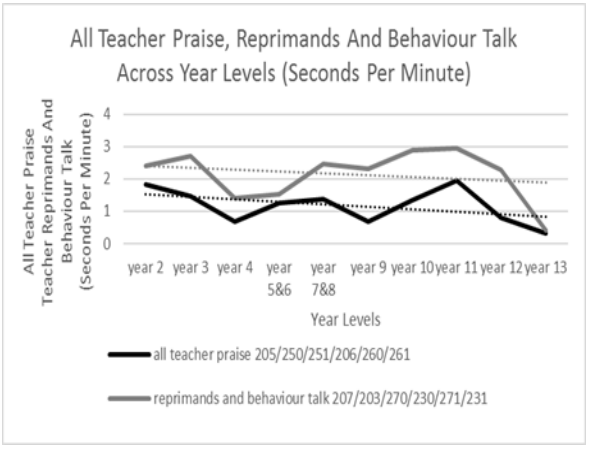


Figure 6.2.6 The Mean Rates (Seconds per Minute) of All Teacher Praise, Reprimands and Behaviour Talk across Year Levels

The mean of teacher praise for work to the target student (250) 0.041 seconds per minute, combined with a dispersion over 0.158 intervals (Figure 6.2.3) when mean student on-task behaviour was 47.07 seconds per minute, even if all occurrences were contingent does not seem sufficient to define behaviour. Teacher praise for behaviour (260) to the target student, mean 0.022 seconds per minute, dispersion 0.074 intervals is of lesser occurrence.

That no positive relationships were found across year rates for teacher praise for work or behaviour, severally or combined, (or teacher reprimands and behaviour talk) and student on-task behaviour that would indicate a characteristic significant relationship exits, supports this contention. All teacher praise to the target student (250/260) related negatively with on-task behaviour in seven of the ten year levels.

Similarly, the mean of teacher reprimands to the target student (270) 0.066 seconds per minute combined with dispersion over 0.224 intervals when mean student unwanted or competing behaviour is 2.196 seconds per minute dispersed over 0.628 intervals does not seem sufficient by itself to contain or limit that behaviour.

Teacher disapproval (reprimand and behaviour talk) severally and combined was greater than approval (praise) for behaviour directed toward the target student. This finding was replicated when all teacher praise (approval) and reprimand and behaviour talk (disapproval) were combined (Table 6.2.2).

Across year levels praise is given to the predominant in-class student behaviour, on-task behaviour and deportment (conduct).

Teacher Praise across Primary, Intermediate and Secondary Schools

Teacher interactions with the target student are minimal, the range for teacher behaviour toward the target student (220/230/240/250/260/270) being 0.008 to 0.75 seconds per minute for Primary School Data, 0.01 to 1.06 seconds per minute for Intermediate data, and 0.02 to 1.21 per minute for Secondary School data.

All teacher praise combined ranges from 0.462 incidents per minute to 1 in year 7 and 8. This corresponds with a rate of 0.318 to 1.840 seconds per minute in year 2.

Teacher praise for work (mean of 0.82 seconds per minute), teacher praise for behaviour (mean of 0.352) occurred within 0.675 and 0.510 of recorded intervals respectively. Not only was the duration (seconds per minute) of this

behaviour low (data represents the sum of all teacher praise for work and behaviour), dispersion across intervals was not pervasive. Interestingly, both the dispersion and duration of teacher reprimands and praise for work were quite similar, albeit reprimands slightly less than praise.

Teacher praise for work did not correlate significantly with student on-task behaviour nor with student unwanted behaviour. Obtained relationships across Primary, Intermediate and Secondary Schools for teacher praise for work were all elevated albeit negative.

Negative relationships were found between teacher praise for work, when teacher behaviour was summed for each category (teacher praise to the whole class, to the target student and to other students was combined).

For Intermediate Schools, all teacher praise combined (Praise for work and behaviour to all targets combined) related to student on-task behaviour $r=0.809$, $p<0.001$. This relationship was insignificant for the first 34 intervals wherein teacher task talk was high and stable; however, the large relationship and effect size was found with reducing rates of teacher task talk and student on-task behaviour, that is as the teacher verbal behaviour increased relative to the referent or background behaviour (on-task behaviour).

Teacher proximity was not related with teacher praise.

Teacher Praise for All Data Combined (N=72)

Teacher praise to the target student related negatively with student on-task behaviour and positively with teacher praise to the whole class for behaviour.

The lack of relationship between all teacher praise (205/250/251/206/260/261) and student on-task behaviour (301/302/320), either contiguously ($r= 0.061$) or with a one interval lag on all teacher praise ($r= - 0.007$) would not be expected from the literature. Nor would the negative correlation found between teacher praise for work to the target student and student on-task behaviour, $r=-0.509$, $p<0.001$ (Table 6.2.4).

No relationships were found with student unwanted behaviour.

Teacher praise to the target student related negatively with student on-task behaviour and positively with teacher praise to the whole class for behaviour.

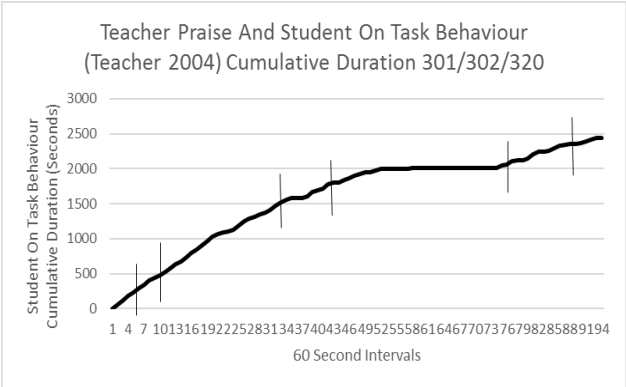
Teacher Praise for One Student and Two Teachers

Teacher praise for work for teacher 2004 occurred 0.065 seconds per minute, for teacher 2005 this was 0.033 seconds per minute. For teacher praise for behaviour the respective times were 0.021 seconds per minute and 0.011 seconds per minute.

The differences between the teachers when all teacher praise was combined were teacher 2004, 0.49 seconds per minute and teacher 2005, 1.211 seconds per minute (Table 6.2.3). There was no relationship with student on-task or unwanted behaviour.

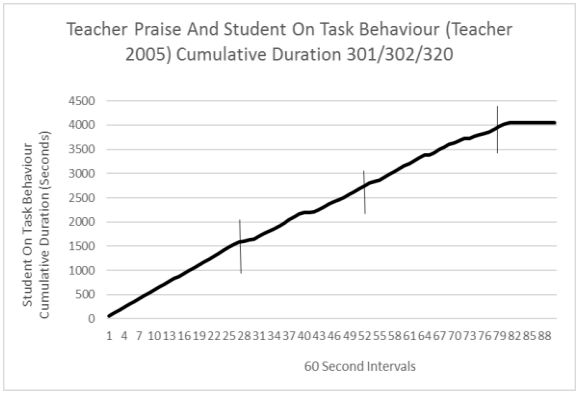
Table 6.2.3 Correlation of the Rates (Seconds per Minute) of Teacher Praise for Work and Behaviour and Student On-Task Behaviour and Unwanted Behaviour for Teachers 2004 and 2005

Teacher Praise For Work And Behaviour.	**Behaviour Code:**	**Correlation:**	
Correlation Of Teacher Praise For Work With:	250	**Teacher 2004**	**Teacher 2005**
student on task behaviour	301/302/320	-0.001	-0.004
student unwanted behaviour	330/305/6/7/8/340/350/360	0.074	-0.088
Correlation Of All Teacher Praise For Work With:	205/250/251		
student on task behaviour	301/302/320	-0.003	0.128
student unwanted behaviour	330/305/6/7/8/340/350/361	0.022	0.049
Correlation Of Teacher Praise For Behaviour With:	260		
student on task behaviour	301/302/320	0.143	0.046
student unwanted behaviour	330/305/6/7/8/340/350/360	-0.051	-0.050
Correlation Of All Teacher Praise For Behaviour With:	206/260/261		
student on task behaviour	301/302/320	0.191	-0.111
student unwanted behaviour	330/305/6/7/8/340/350/360	0.045	0.194



Point:	6	10	33	43	77	89
Value:	1	1	1	1	1	1

Figure 6.2.7 Teacher 2004 Praise to the Target Student for Work and Student On-Task Behaviour (Cumulative Duration On-Task Behaviour)



Point:	28	52	79
Value:	1	1	1

Figure 6.2.8 Teacher 2005 Praise to the Target Student for Work and Student On-Task Behaviour (Cumulative duration On-Task Behaviour)

Teacher praise for work or behaviour did not relate with either student on-task behaviour or unwanted or competing behaviour severally or combined for either teacher.

Teacher 2004 praised the target student six times in 94 minutes, teacher 2005 was less at 3 times in 88 minutes.

Both Figures 6.2.7 and 6.2.8 show teacher praise to the target student for work occurring in an apparently random manner, often during or immediately prior to a decrease in student on-task behaviour. Although this may reflect the previously described characteristic negative relationship between teacher verbal behaviour and student on-task behaviour (Sections 5.15.6). The figures indicate clearly the extent to which praise for work is embedded amid a high rate (seconds per minute) of student on-task behaviour. Anderson, Everton and Brophy (1979) found less than 5% of teacher praise to be behaviour specific, this mandates it being behaviour specific to differentiate its referents from the predominant student activity – student on-task behaviour.

Teacher Praise for Those Teachers with Expressed Management Difficulty (N=17) and Others (N=53)

For the sample, N=17 (Table 6.2.7), the only relationships approximating significance were between teacher praise for work to the whole class (205) and student on-task behaviour (301/302/320, r=-0.465, p<0.10), and teacher praise to the target student for behaviour (r=0.309) and student on-task behaviour (301/302/320). These do not fall within the 95% confidence level adopted.

For sample N=53 teacher praise to the target student for work related moderately (r=-0.419, p<0.01) with student on-task behaviour as did all teacher praise for behaviour, r=0.293, p< 0.05. This latter correlation may reflect praise for behaviour functioning as a discriminative stimulus or negative reinforcer for on-task behaviour. All teacher praise for behaviour related r=0.568, p<0.001 with all teacher reprimands and behaviour talk. For all data combined the correlation, r=0.466, p<0.001 was similarly large.

For both N=17 and N=53 correlations between teacher praise to the target student for work (250) were insignificant and of negative valence.

No significant relationships were obtained between all teacher praise for work (205/250/251) and student on-task behaviour (301/302/320) for either sample.

No relationships were found between all teacher praise for work and behaviour combined (205/250/251/206/260/261) and student on-task behaviour (301/302/320) for either sample. A one interval lag on all teacher praise (205/250/251/206/260/261) and subsequent correlation with student on-task behaviour (301/302/320) indicated coefficients of r=0.070 for N = 17 and r=-0.055 for N=53, neither of which are significant. This juxtaposition of the independent variable relative to the dependent variable indicated that teacher praise for work and behaviour combined did not have a substantive relationship on subsequent student on-task behaviour.

The negative correlation obtained between teacher praise for work for N=53 and the negative valences of contiguous relationships, indicate that praise for work

offers increments to student on-task behaviour is questionable based on this data (Table 6.2.4).

Table 6.2.4 Correlation Between the Mean Rates (Seconds per Minute) of Teacher Praise for Work and Behaviour Severally and Combined and the Mean Rate (Seconds per Minute) of Student On-Task Behaviour across all Data Combined and Differentiated

Correlation Between Teacher Praise For Work And				**Samples:**			
Behaviour Differentiated And Student On Task	**Sample Size:**	**n=6**	**n=32**	**n=29**	**n=17**	**n=53**	**n=72**
Behaviour:	**Behaviour Code:**	**Primary:**	**Intermediate:**	**Secondary:**	**N=17**	**N=53**	**All Data:**
teacher praise for work to whole class	205	-0.232	-0.110	-0.135	-0.465	-0.148	-0.138
teacher praise for work to target student	250	-0.386	-0.251	**-0.342**	0.200	**-0.419**	**-0.509**
teacher praise for work to other students	251	-0.136	-0.059	0.055	0.143	0.044	0.064
all teacher praise for work	205/250/251	-0.265	-0.164	-0.110	-0.021	-0.149	-0.132
teacher praise for behaviour to whole class	206	-0.177	0.045	0.069	-0.043	0.227	**0.403**
teacher praise for behaviour to target student	260	0.130	-0.022	0.124	0.309	-0.136	-0.048
teacher praise for behaviour to other students	261	0.199	-0.042	0.103	-0.096	0.198	0.138
all teacher praise for behaviour	206/260/261	0.100	-0.009	0.150	-0.027	**0.293**	**0.314**

While teacher task talk greater than 50% of available time is sufficient to effect considerably improved on-task behaviour and reduce 'unwanted' or competing behaviour (Section 5.4) no similar positive relationship was found to exist between teacher praise for work, severally or combined, be it directed to the target student or with all teacher praise combined.

Wehby, Symons and Shores (1995) found praise rates of between 0.02 and 0.04 per hour which are considerably less than what was found in the current study. Sutherland, Wehby and Yoder (2002) found praise rates of 0.646 per minute

Nafpaktitis, Mayer and Butterworth (1985) in assessing natural rates of teacher approval and disapproval, found an appropriate approval rate of 0.9 events/min. Merrett and Wheldall (1987b) found rates of approval **(**1.15/min.) overall to be greater than disapproval (0.93/min.). Most approval was directed towards academic behaviour. Wheldall, Houghton and Merrett (1989) found that teachers approved more than they disapproved and that most approval responses were academically directed. Mean approval rates/min. of 0.65 were found in Secondary School, 1.15 in Primary/middle school settings. Both approval and disapproval rates were higher in the junior classes. Wheldall and Beaman (1994) reported a mean approval rate 0.45/min. and disapproval rate of 0.40/min. in the Secondary School setting. Overall approval was slightly greater than disapproval.

Gunter, Ellis, De Briere and Wehby (1993) looking at both regular classrooms and special education classes found praise rates in the former to be 0.02/min., and for special education classes 0.075/min. Praise for compliance constituted 2% of the total time. In classes of children with emotional and behavioural disorders (EBD), Shores, Jack, Gunter, Ellis, De Briere and Wehby (1993) recorded praise statements of 0.017/min. In similar classes Wehby, Symons and Shores, (1995) found praise rates of between 0.02 and 0.04 per hour.

In respect to teacher praise across Primary Intermediate and Secondary Schools it was expected that praise for work and behaviour severally and combined would be higher for the Primary data and be of more significant relationship than for the other school levels. Teacher praise for work combined was highest in the Intermediate School data (1.025 seconds per minute), followed by Primary School (0.820 seconds per minute) and then Secondary School (0.652 seconds per minute). Dispersion was equivalent across sectors, occurring in almost all intervals. Praise for behaviour was higher in the Primary School data relative to the other two sectors (0.513, 0.343 and 0.271 seconds per minute respectively, dispersion was across approximately every interval). Teacher praise for work did not relate positively with student on-task behaviour, all relationships were elevated and negative. The correlation of teacher praise for behaviour combined, with student unwanted behaviour, was negative and low. Negative relationships were found between teacher praise for work and behaviour, when teacher behaviour was summed for each category (teacher praise to the whole class, to the target student and to other students was combined).

For sample N=53 teacher praise to the target student for work (250) correlated significantly ($r=-0.419$, $p<0.01$) with student on-task behaviour as did all teacher praise for behaviour (206/260/261), r0.293, $p< 0.05$. For both N=17 and N=53 correlations between teacher praise to the target student for work (250) were of negative valence. Rather than anomalous, this could be an artefact of teacher praise for behaviour resulting in greater student attention and/or functioning as a discriminative stimulus for on-task behaviour.

No significant correlations were obtained between all teacher praise for work (205/250/251) and student on-task behaviour (301/302/320) for either sample.

These results indicate that the greater rate of teacher task talk, the greater negative correlation is realized between teacher praise and student on-task behaviour. This is contrary to what was expected.

When all data was combined (Section 5.3), teacher praise for work to the target student (250) was negatively correlated with student on-task behaviour r=-0.509, p<0.001. Teacher praise for work and behaviour combined to the target student (250/260) correlated r=-0.485, p<0.001 with student on-task behaviour (301/302/320). A one interval lag on teacher praise for work and behaviour to the target student (250/260) was r=-0.385, p<0.01. This correlation indicated that viewing praise as a subsequent reinforcing event is not valid based on this data.

The lack of significant correlation between all teacher praise (205/250/251/206/260/261) and student on-task behaviour (301/302/320), either contiguously (r= 0.061) or with a one interval lag on all teacher praise (r=-0.007) would not be expected from considerable of the literature. Nor would the negative correlation found between teacher praise for work to the target student and student on-task behaviour r=-0.509, p< 0.001.

Teacher praise to the target student correlated negatively with student on-task behaviour and positively with teacher praise to the whole class for behaviour. No significant relationships were found between teacher praise severally and combined and student unwanted behaviour.

Summary and Discussion

The results from the data for One Student and Two Teachers characterise the difficulties associated with praise (page 257). Teacher praise for work for teacher 2004 occurred 0.065 seconds per minute, for teacher 2005 this was 0.033 seconds per minute. For teacher 2004, praise to the target student for work occurred 6 times in 94 minutes, for teacher 2005, 3 times in 88 minutes. That is, the natural rate is minimal.

The results show this infrequent use of teacher praise to the target student for work occurred in an apparently random manner or rarely contingently, occurring

during or immediately prior to a decrease in student on-task behaviour. The figures (6.2.7 and 6.2.8) indicate clearly the extent to which praise for work is embedded in a high rate (seconds per minute) of student on-task behaviour. Research-based parameters necessary for praise to be effective (Hester et al., 2009) include contingency, immediacy, consistency, effect on the behaviour, proximity and specificity. The application of these parameters within a classroom setting in regard to the student's predominant behaviour, on-task behaviour, is not practicable in any but a very specific academic skill manner. Even the practicality of this in fulfilling these criteria in the classroom setting is questionable.

There was no significant relationship between teacher praise for work and student on-task behaviour or student unwanted behaviour.

For samples N=17, N=53, and all data combined, teacher praise for work related negatively with student on-task behaviour. These results indicate teacher praise for work to have a deleterious effect on student on-task behaviour.

Teacher proximity was not significantly related with teacher praise.

The findings in the current study are not congruent with those found by Thomas and associates (1978) who found the rate of teacher approval in year 7 New Zealand schools to be correlated with student engagement (r=0.40), or other studies indicating a positive relationship between teacher praise and student on-task behaviour.

The lack of significant positive correlation between teacher praise for work or behaviour severally or combined with student on-task behaviour, especially in regard to the data relating to N=17 and N=53 and all data combined (significant negative relationships), indicate that hypothesis H_4 cannot be upheld.

Hypothesis H_4 stated that a high rate of teacher task talk would be associated with a high rate of student on-task behaviour and with praise being significantly related to both variables. *This would be evident in a significant positive correlation between teacher praise and student on-task behaviour given a high rate of teacher task talk. That is a conditional functional relationship.*

These relationships were not upheld in respect to praise, Hypothesis H_4 can be rejected.

Praise by its very nature is intrusive and if general praise, it is not necessarily aligned with the target behaviour in the sense of perpetuating the frequency or quality of its occurrence – certainly not in respect to consistency of application, being of such low occurrence and embedded in, or related to the predominant student behaviour, student on-task behaviour. More protracted praise, as is inherent in behaviour specific praise, is inherently intruding more substantially on on-task behaviour.

Like reprimand, praise stops the contiguous student behaviour, and this more so given a high rate of teacher task talk and student on-task behaviour (sample N=53). Positive relationships were found between praise and on-task behaviour for Intermediate School data albeit with reducing rates of teacher task talk and student on-task behaviour.

These results are in accord with Esler (1983), who reported that correlations between teachers' rates of praise and students' on-task behaviour are not always positive, and even when correlations are positive, they are usually too low to be considered significant.

From the current data, significant positive correlations with on-task behaviour can only result given student attention is on the teacher at that time and that such attention is recorded as student on-task behaviour. Courtesy would demand that student attending would be the most probable response the shorter the observation interval. This would be likely to be recorded as on-task behaviour. Longer observation intervals would be more likely to discern the longer-term effect on student on-task behaviour, as is the case in the current study. Teacher praise for work is embedded amid a high rate (seconds per minute) of student (on-task) behaviour and such low rates of occurrence must reflect the arbitrary nature of praise and consequently the intrusive and distracting nature of it as is reflected in the negative correlations found with student on-task behaviour.

Given the extremely low rate of occurrence of teacher praise for work and behaviour (both in respect to incidents and seconds per minute) found in the current study, and the negative correlations (and significantly so for N=53 and when all data is combined) found between teacher praise for work and student on-task behaviour, it is unsurprising that teacher praise is not viewed or practiced by teachers as if it were fundamental to effective classroom management. In the current study, teacher behaviour directed toward an individual student is minimal even when compared with overall teacher behaviour, hence it is unsurprising that targeted praise, which is of substantially lesser rate, requires little increase in rate of occurrence to become obvious to other students and disingenuous in nature. It makes it unlikely that increasing the rate of praise within the classroom would result in increments in student on-task behaviour.

These results are consistent with those reported by: Kounin (1970) who found that praise did not contribute to effective classroom management; Brophy (1981) who concluded praise is typically used infrequently, without contingency, specificity, or credibility and Esler (1983), who reported that correlations between teachers' rates of praise and students' learning gains are not always positive, and even when correlations are positive, they are usually too low to be considered significant. Owen, Slep and Heyman (2012) found praise and positive nonverbal responses resulted in variable outcomes. “The effect of praise appears to be less immediate than the effect of reprimand, as evidenced by the lack of a consistent connection between praise and compliance in the literature. They concluded that observational studies of the relationship between praise and compliance in both clinical and nonclinical samples have not demonstrated a reliable link between the two variables” (p. 379).

Teacher praise is often reported as an underused teaching tool despite the supporting research (Shores et al., 1993, Sutherland, Wehby and Yoder, 2002). The current study, plus referenced research findings would question this conclusion. Beaman and Wheldall (2000), summarising descriptive analyses into teachers’ use of approval and disapproval in the classroom, concluded, “There is little evidence to suggest that teachers, universally, systematically deploy contingent praise as positive reinforcement in spite of the considerable literature testifying to its

effectiveness. In particular, praise for appropriate classroom social behaviour is only rarely observed." (p. 431).

Both teacher praise and reprimand are intrusive on the pre-existing behaviour, usually praise is imposed on to a high rate of on-task behaviour, reprimand on to a lower rate of unwanted or competing behaviour. Both interventions are likely to stop the behaviour immediately, the former does not automatically carry the demand characteristic of re-establishing a work focus, the latter does. Maintaining a high rate of teacher task talk inherently provides a 'rich schedule of reinforcement for the alternative behaviour' in so far as reprimands are concerned.

The extremely low natural rate of praise relative to the rate of behaviour it is 'intended' to increase, reported in the literature and in the current study, would appear to indicate a consensual perception amongst teachers as to its questionable effectiveness in enhancing student on-task behaviour and reducing student unwanted behaviour.

Including 'attending' or 'orientating toward the appropriate object or person' (Sutherland et al, 2000) as implicit in student on-task behaviour avoids looking at praise initially stopping the behaviour it is intended to reinforce. It is thus a measure of student responsiveness to the teacher, or teacher as discriminative stimulus. This is also done in the current study, albeit the 60 second interval adopted circumvents this to an extent by greater inclusion of subsequent behaviour and further by juxtaposing (cross correlating) the data by one interval. Rather than the effect of praise being less immediate than the effect of reprimand, as evidenced by the lack of a consistent connection between praise and compliance in the literature (Owen et al., 2012), both correlations and cross correlations indicated a lack of effect over time within the first forty minutes of class time, that is when associated with high rates of teacher task talk and student on-task behaviour.

Shores et al. (1993) and Walker et al., (1999) saw praise as promoting teacher student relationships and creating a more supportive learning environment within the class. The current results do not support this contention.

Generalising from functional analysis results indicating specific behaviours such as praise to be reinforcing seems more risky or tenuous than does generalising from research-based principles across settings as is inherent in assaying the specific behaviour (subsequent event) in reference to the backgound behaviour to which it applies. In this case student on-task or unwanted behaviour.

6.3 Teacher Reprimand and Behaviour Talk

Introduction

Van Houten, Nau, Mackenzie-Keating, Sameoto and Colavecchia, (1982) found that higher frequencies of reprimand delivery were associated with lower frequencies of disruptive behaviour, and that reprimands are most effective when they consistently follow each instance of an unwanted behaviour.

"Punishment will produce a greater reduction in response rate if an unpunished alternate response is available…and if that response is reinforced on a schedule equal to or greater than reinforcement for the punished response" (Spradlin, 2002, p. 475., Azrin &Holz, 1966, Kazdin, 1966, Fisher et al., 1994). Owen, Slep and Heyman (2012) found in their review of studies that reprimand and negative nonverbal responses consistently resulted in greater child compliance, praise and positive nonverbal responses resulted in mixed child outcomes.

To be effective, punishment should stop when the behaviour stops **(**Lerman and Vorndran, 2002). Within the classroom any ongoing positive effect from such intervention is dependent on the immediacy of redirection to work, directing task related attention to the on-task behaviour of others (reducing the public nature of the intervention), and all within the period in which the unwanted behaviour is attenuated, i.e., the teacher continuing to proactively define the situation.

Reprimands mainly result in the immediate suppression of unwanted behaviour, albeit temporarily (Nafpaktitis et al., 1985; Jack, Shores, et al., 1993;

Sloman et al., 2005) and this effect is reinforcing the continued and escalating use of these strategies (Van Houten, Nau, McKenzie-Keating, Sameoto and Colavecchia, 1982).

In the current study reprimands were analysed separate from and combined with teacher behaviour talk, the latter largely constituting the protracted or latter aspects of the reprimand process.

It is considered that maintaining a high rate of teacher task talk that is public in nature (202, 202/220/221) inherently makes reprimand (and behaviour talk) more congruent with established research-based principles for effective punishment. It limits reprimand and behaviour talk in time (Abromowitz, O'Leary & Futtersak, 1988), provides alternative demand characteristics on a continuous schedule prior to and after the reprimand event or process, and is more likely to result in greater contingency and congruity of reprimand with the unwanted behaviour.

Results

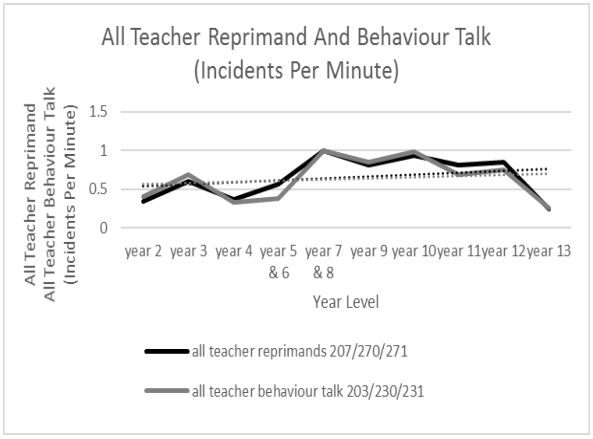
In the current study teacher disapproval (reprimand and behaviour talk) severally and combined was greater than approval (praise) for behaviour directed toward the target student. This finding was replicated when all teacher praise (approval) and reprimand and behaviour talk (disapproval) were combined.

Teacher Reprimand and Behaviour Talk across Year Levels

No consistent significant relationships were found between teacher behaviour directed to the target student (including reprimands) and student unwanted behaviour nor with student on-task behaviour that would indicate a characteristic significant relationship exists. Combining teacher reprimands and teacher behaviour talk rendered no relationships. There was a lack of any consistent significant relationship between any measured teacher behaviour directed to the target student and student on-task or unwanted behaviour.

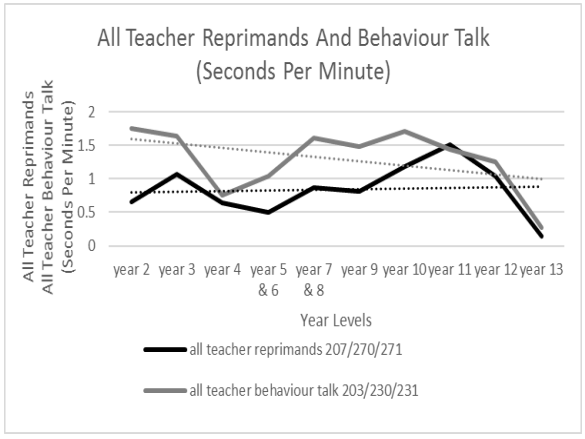
The mean of teacher reprimands to the target student (270) 0.066 seconds per minute combined with dispersion over 0.224 intervals when mean student

unwanted or competing behaviour is 2.196 seconds per minute dispersed over 0.628 intervals makes this lack of relationship unsurprising and does not seem sufficient by itself (reprimand and behaviour talk severally or combined) when directed to the target student to contain or limit that behaviour.



r =	0.942

Figure 6.3.1 the Mean Rates (Incidents per Minute) of All Teacher Reprimand and Behaviour Talk Differentiated by Year Level



r =	0.69

Figure 6.3.2 The Mean Rates (Seconds per Minute) of All Teacher Reprimand and Behaviour Talk Differentiated by Year Level

A large relationship was found between all teacher reprimand and all teacher behaviour talk (incidents per minute), indicating a close, almost 1:1 relationship between the two. When time (seconds per minute) was considered the relationship was considerably less (Figure 6.3.2). Across almost all year rates behaviour talk exceeded reprimand (seconds per minute).

Moderate negative relationships were found between all teacher task talk and student unwanted behaviour (year 7 and 8, $r=-0.358$, $p<0.05$) for year rates 5 and 6, 7 and 8, and 9 ($p<0.05$). For year rates 5 and 6 and 12, teacher behaviour talk and reprimand and behaviour talk related significantly with student unwanted behaviour.

Moderate positive relationships were found between student on-task behaviour and all teacher task talk (202/220/221) for years 3, 4, 7 and 8, 9, 10, and 13 ($p<0.05$). For year 7 and 8 $r=0.384$, $p<0.05$) when this is calculated by total number of sessions.

Moderate to large negative relationships were found between student on-task behaviour and student unwanted or competing behaviour for seven of the ten year levels.

Given the variability and small sample size, these trends can only be seen as indicative.

Teacher Reprimand and Behaviour Talk across Primary, Intermediate and Secondary Schools

Teacher task talk (220), reprimand (270) and reprimand and behaviour talk (270/230) to the target student, despite not relating significantly to student on-task or unwanted or competing behaviour all showed a negative relationship across year rates. This suggests that teacher task talk directed to an individual student detracts from student task focus, as do reprimands alone and reprimands plus behaviour talk.

Introducing a one or two interval lag on teacher reprimand and behaviour talk relative to student unwanted or competing behaviour resulted in no substantive changes to the respective correlations. Given that reprimands can be more properly seen as subsequent rather than contiguous events, differences would be more likely.

Teacher reprimands are of considerably higher rate (seconds per minute) for Primary School than are evident in both Intermediate and Secondary School data (70.96% of reprimand and behaviour talk compared to 28.67% and 31.10% respectively). The larger amount of the sum of teacher reprimand plus behaviour talk for both Intermediate and Secondary groupings is teacher behaviour talk. The larger amount of student unwanted or competing behaviour is social talk to other students for Primary, Intermediate and Secondary School data (93.31%, 83.37% and 90.72% respectively). This differential is understandable given the lesser social competence of younger students and the recognized greater challenge offered by Intermediate School students.

A large relationship and effect size was found between the sum of teacher reprimands (207/270/271, $r=-0.674$, $p<0.001$) and student unwanted behaviour for

Secondary School data. No further significant relationships were found between teacher reprimands and behaviour talk and student on-task behaviour or unwanted behaviour.

The principal differences between the Primary School data and the Intermediate and Secondary School data are found regarding lower rate (seconds per minute) of teacher task talk, higher rate of teacher reprimands, considerably greater rate of teacher proximity to the target student, and a higher level of student on-task behaviour. Further analysis, however, indicated that Primary School student on-task behaviour may have been under the control of negative reinforcement contingencies.

This is consistent with the hypothesis (H_3) that a relationship exists between low teacher task talk, greater reprimand and less student on-task behaviour, that this weakens or makes non-existent the relationship between student on-task behaviour and teacher task talk. When reprimands and behaviour talk are combined, the results indicate the opposite trend, that teacher behaviour talk is greater for Intermediate and Secondary Schools studied and can perhaps be seen as partially supplanting reprimands possibly as a function of greater social skill and responsiveness to reason by these older students.

Additionally, student unwanted or competing behaviour which is mainly constituted of student social talk to other students (330) increases over school type or age of student which can be perhaps be seen as more amenable to change by talking about the behaviour rather than reprimanding.

Table 6.3.1 Mean Rates (Seconds per Minute) of the Total of Teacher Task Talk, Reprimands, Reprimands and Behaviour Talk, Student Social Talk and On-Task and Unwanted Behaviour, and Percentages of Social Talk in Student Unwanted Behaviour and of Reprimand in Reprimand and Behaviour Talk for Primary, Intermediate and Secondary Schools

Behaviour:	Behaviour Code:		Primary:	Intermediate:	Secondary:
student on task	301/302/320	seconds/minute	51.728	47.284	46.662
sum of teacher task talk	202/220/221	seconds/minute	24.912	27.472	30.519
sum of teacher reprimand	207/270/271	seconds/minute	1.441	0.711	0.871
sum of teacher reprimand and behaviour talk	207/203/270/230/271/231	seconds/minute	2.031	2.478	2.801
student unwanted or competing behaviour	330/304/05/06/07/07/340/50/60	seconds/minute	1.443	3.309	4.300
student social talk to other students	330	seconds/minute	1.346	2.758	3.901
% of social talk in unwanted behaviour			93.313	83.368	90.717
% of reprimand in reprimand and behaviour talk			70.959	28.674	31.102

Teacher Reprimand and Behaviour Talk for All Data Combined

Table 6.3.2 Correlations Between the Mean Rate (Seconds per Minute) of Teacher Reprimands and Behaviour Talk to the Target Student and Unwanted Behaviour, with and without a one interval Lag on the Mean Rate (Seconds per Minute) of Teacher Reprimands and Behaviour Talk for all Data Combined, N=72

Correlation Between Teacher Reprimand And Behaviour	270/230		
Talk And Unwanted or Competing Behaviour:	330/304/5/6/7/8/340/350/360	Correlation:	Significance:
no lag		0.064	
one interval lag on reprimands and behaviour (270/230)		**0.467**	**P< 0.001**

Teacher reprimand and behaviour talk to whole class and other students did not relate with student unwanted or competing behaviour either severally or combined (Table 6.3.2). Introducing a one interval lag on reprimands and behaviour talk to the target student (270/230) realised a moderate to large relationship ($r=0.467$, $p<0.001$), this indicating a high congruence of reprimands and behaviour talk with student unwanted or competing behaviour.

The data from teacher reprimands alone directed to the target student (270) realised a significant level of congruence (positive relationship) with student unwanted behaviour, and negative relationship with student on-task behaviour. The failure of teacher reprimands to reach a negative correlation with student unwanted behaviour and positive relationship with student on-task behaviour when the data was juxtaposed (lagged) by additional intervals, indicates that teacher reprimands did not have a suppressive effect on student unwanted behaviour and corresponding positive effect on on-task behaviour..

A one interval lag on the sum of teacher reprimands and behaviour talk directed to all targets realised a large relationship, $r=0.622$, $p<0.001$ with student unwanted or competing behaviour (330/305/306/307/308/340/350/360). This juxtaposition of the independent variable relative to the dependent variable shows the high rate of reprimand corresponding to unwanted or competing behaviour. For real time data $r=0.248$, $p<0.05$. That all teacher reprimands and behaviour talk toward all targets combined related more than teacher reprimands and behaviour talk targeted toward an individual student is consistent with the view that teacher verbal behaviour directed class-wide is of greater effect in the management of the behaviour of an individual student than teacher behaviour directed to the target student alone

The data indicate that whilst the correlation of teacher reprimands and behaviour talk is highly related with student unwanted behaviour, and is protracted over time (two intervals), the suppression effect on student unwanted behaviour is neither substantial nor significant.

All teacher behaviour talk (203/230/231) related moderately, $r=-0.350$ with teacher proximity to the target student (201). This indicates that this behaviour was likely to be public in nature.

Teacher Reprimand and Behaviour Talk for Two Teachers and One Student

For reprimands and behaviour talk combined (270/230) directed to the target student, for teacher 2004 it was 24%, for teacher 2005 it was 4.04% of all teacher reprimands, behaviour talk, orders and threats. Teacher talk directed to the target student for teacher 2004 was 3.29 seconds per minute for teacher 2005 it was 0.77 seconds. Teacher reprimands to other students and behaviour talk to other students were 1.72 and 1.49 seconds per minute respectively for teacher 2004 and for teacher 2005, 0.3 and 0.58 seconds.

Teacher focus on unwanted or competing behaviour (the sum of reprimand, behaviour talk, orders and threats) for teacher 2004 constituted 25.54% of all teacher task talk and praise (6 seconds and 23.49 seconds per minute respectively),

for teacher 2005 this was 0.62% (1.98 seconds and 25.05 seconds per minute respectively).

Teacher 2004 focus both positively and negatively was substantially more on the target student than teacher 2005 across all measured behaviour.

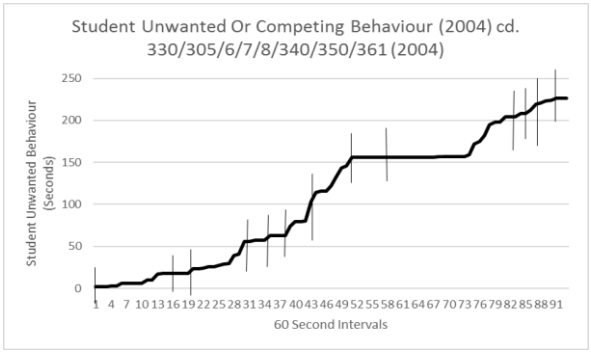
Table 6.3.3 Correlation between Teacher Reprimands Differentiated and Student Unwanted or Competing Behaviour and Student On-Task Behaviour for Teachers 2004 and 2005

	Behaviour Code:	**Teacher 2004**	**Teacher 2005**
Correlation Of Teacher Reprimands Differentiated With			
Student Unwanted Or Competing Behaviour And	**330/305/6/7/8/340/350/360**		
Student On Task Behaviour:	**301/302/320**		
teacher reprimands whole class	207	-0.129	-0.071
teacher reprimands target student	270	**0.311**	-0.008
teacher reprimands other students	271	-0.011	0.149
the sum of teacher reprimands	207/270/271	0.021	0.119
with student on task behaviour	207/270/271 with 301/302/320	-0.147	0.078

For teacher 2004, teacher reprimands to the target student related positively (moderate relationship) with student unwanted or competing behaviour ($r=0.311$, $p<0.001$). The positive value may reflect reprimands being a discriminative and or reinforcing stimulus for unwanted behaviour in this instance. The sum of teacher reprimands correlated significantly neither with on-task behaviour nor unwanted behaviour for both teachers.

Correlations between teacher reprimands to the target student with student unwanted or competing behaviour contiguously and with a one and two interval lag to reflect the consequential nature of reprimands realised no improved association between variables.

Student unwanted or competing behaviour increases over time, more so for teacher 2005.



Point:	1	16	20	31	35	39	43	51	58	83	86	88	91					33
Value:	2	3	1	1	5	5	3	3	2	4	2	1	3					2

Figure 6.3.3 Student Unwanted or Competing Behaviour (Cumulative Duration) and Teacher 2004 Reprimands to the Target Student

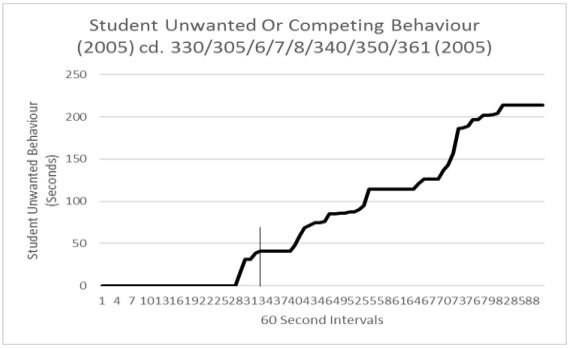


Figure 6.3.4 Student Unwanted or Competing Behaviour (Cumulative Duration) and Teacher 2005 Reprimands to the Target Student

Figure 6.3.3 shows teacher reprimand occurring variably contingent on student unwanted behaviour for teacher 2004. This plus the visible inconsistency of application have contributed to the lack of significant relationship between the two variables.

One teacher used an individual focussed attention for work and reprimand approach (teacher 2004), the other (teacher 2005) a whole class focus and avoidant approach. The latter was more effective in realising less unwanted behaviour, greater on-task behaviour and remaining in class for a considerably longer period. As Sherrill and associates (1996) concluded in their study, “If you can reprimand only a small proportion of the child’s solicitations for attention, ignore rather than attend to the rest; attending to a misbehaviour is a serious mistake when few misbehaviours are reprimanded” (p.234). This approach is evidenced for teacher 2005.

Despite the low and diminishing rates of teacher task talk to the whole class and combined and student on-task behaviour for both teachers, the overall relationship between teacher task talk to the whole class and student on-task behaviour, $r= 0.549$, $p< 0.001$ was retained for teacher 2005. This was associated with a better overall outcome. This is inconsistent with the negative view of ‘avoidant teaching’ presented by Carr, Taylor and Robinson (1991, p. 523) that “adults engaged in teaching activities with non-problem children more often than

with problem children … when an adult worked with a problem child the breadth of instruction was more limited (fewer task demands were presented) and typically involved those tasks associated with lower rates of problem behaviour.

Teacher Reprimand and Behaviour Talk for Teachers with Expressed Management Difficulty (N=17) and Others (N=53)

Table 6.3.4 Mean Rates (Incidents and Seconds per Minute) of Teacher Reprimands, Behaviour Talk and Student Social Talk to Other Students as Component Parts of the Sum of the Mean Rates (Incidents and Seconds per Minute) of all Teacher Reprimands and Behaviour Talk, and Student Unwanted Behaviour for Samples N=17 and N=53

		N=17		N=53	
Behaviour:	**Behaviour Code:**	**seconds/minute**	**incidents/minute**	**seconds/minute**	**incidents/min**
teacher reprimands the whole class	207	0.834	1	0.160	1
teacher reprimands the target student	270	0.178	0.758	0.028	0.606
teacher reprimands other students	271	1.645	1	0.370	1
sum of teacher reprimands	207/270/271	2.658	1	0.559	1
teacher behaviour talk to the whole class	203	0.900	0.909	0.541	0.970
teacher behaviour talk to the target student	230	0.217	0.758	0.030	0.606
teacher behaviour talk to other students	231	1.221	1	0.609	1
sum of teacher behaviour talk	203/230/231	2.339	1	1.181	1
social talk to other student	330	6.023	1	2.106	1
sum reprimands and behaviour talk	207/203/270/230/271/231	4.996	1	1.739	1
student on task behaviour	301/302/320	36.241	1	45.579	1
student unwanted or competing behaviour	330/304/05/06/07/08/340/350/360	6.975	1	2.363	1
sum of teacher task talk	202/220/221	22.283	1	30.392	1
all teacher praise	205/50/51/206/60/61	1.088	1	1.194	1
student on task	301/302/320	36.241	1	49.030	1

Dispersion of behaviour across intervals is equivalent for both samples (Table 6.3.4).

Sample N=17, teachers having expressed management difficulty, is 4.75 times more reprimand (207/270/271) 'rich' (seconds per minute) than sample N=53. The sum of teacher reprimands and behaviour talk (207/203/270/230/271/231) has occurred 2.87 times more in sample N=17 and unwanted or competing behaviour has occurred (330/303/304/3305/306/307/340/350/360) 2.95 times more. There was greater variability within and across intervals apparent regarding teacher reprimands and behaviour talk (203/230/231/207/270/271) for sample N=17 relative to N=53.

The summation of teacher reprimands and behaviour talk is constituted of 53.19% reprimands (207/270/271) for sample N=17 and 32.12% for N=53, the complement being behaviour talk (206/260/261). Teacher behaviour talk was

defined as qualitative negative statement about conduct. Relationships between these two categories are shown in the following table (6.3.5), maximum correlation for N=17 being with a two-interval lag on reprimands (r=0.289), for N= 53 the maximum moderate to large relationship was with the real-time recording (r=0.432, p<0.01).

Table 6.3.5 Correlations between the Mean Rates (Seconds per Minute) of all Teacher Reprimands and all Teacher Behaviour Talk with Lags on the Mean Rate (Seconds per Minute) of Teacher Reprimand for Samples N=17 And N=53

Behaviour:	Code:	real time	1 interval lag	2 interval lag	3 interval lag
all teacher reprimands	207/270/271				
all teacher behaviour talk (N=17)	203/230/231	0.079	0.237	0.289	-0.001
all teacher behaviour talk (N=53)	203/230/231	**0.432**	0.106		

For N=17 student unwanted or competing behaviour (330/304/305/306/307/308/340/350/360), 86.35% of this is constituted of target student social talk to other students (330), in N=53 this is 89.14% This indicates N=17 has a greater percentage of more extreme behaviour than N=53.

No significant relationships were found between teacher reprimands and behaviour talk, and student unwanted or competing behaviour (r=0.027 and r=0.078, respectively) when compared contiguously (Table 6.3.6). On the face of it this would indicate that reprimand and behaviour talk was not related to the behaviour that it was presumed to reduce. Teacher reprimand and behaviour talk are subsequent events however and are looked at further in that context.

With a two-interval lag on reprimands for sample N=17 the relationship between reprimands and behaviour talk and student unwanted or competing behaviour is large, r=0.567, p<0.001. For sample N=53 the relationship is moderate to large, r=0.401, p<0.01. There is greater duration of reprimand and behaviour talk and variability in the sample of those teachers expressing management difficulty and those not doing so (N=53). This may reflect a tendency by teachers in N=17 to 'follow' the unwanted or competing behaviour with reprimands, reprimands being of greater duration (seconds per minute) both within and across intervals.

Lagging N=17 by one interval (60 seconds) realises a correlation of r= 0.36 which is not significant. Lagging N=53 by two intervals (120 seconds) realised a

correlation coefficient of r=0.03. The lags adopted are optimal for the respective data sets.

Table 6.3.6 Correlation between the Mean Rates (Seconds per Minute) of all Teacher Reprimand and Behaviour Talk (203/230/231/207/270/271) and the Mean Rates (Seconds per Minute) of Student On-Task Behaviour and Student Unwanted Behaviour with Lags on Teacher Reprimands for Samples N=17 And N=53

N=17	**one interval lag on**	**real time**	**one interval**	**two interval**	**three interval**	**four interval**
Correlation:	**unwanted behaviour**	**recording**	**lag on**	**lag on**	**lag on**	**lag on**
			reprimands	**reprimands**	**reprimands**	**reprimands**
	1	0	-1	-2	-3	
correlation reprimand and unwanted behaviour	-0.201	0.027	0.360	**0.567**	0.398	0.153
correlation reprimand and on task behaviour	0.107	0.107	-0.056	-0.370	-0.402	-0.200
N=53	**one interval lag on**	**real time**	**one interval**	**two interval**	**three interval**	
Correlation:	**unwanted behaviour**	**recording**	**lag on**	**lag on**	**lag on**	
			reprimands	**reprimands**	**reprimands**	
	1	0	-1	-2	-3	
correlation reprimand and unwanted behaviour	-0.071	0.078	**0.402**	**-0.353**	-0.158	
correlation reprimand and on task behaviour	0.157	0.157	-0.089	**0.481**	**0.336**	

This data shows the protracted nature of reprimand and behaviour talk with sample N=17 relative to N=53. The greater relationship between all teacher reprimand and all teacher behaviour talk for N=53 being the real-time recording, indicating behaviour talk to be an integral part of reprimand. A one interval lag and the relationship is not significant. For N=17, the maintenance of elevated relationships indicates the protracted nature of both.

This analysis resulted in respective moderate to large relationships of r=0.567, p<0.01 (N=17) and r=0.401, p<0.01 (N=53). For those teachers not expressing difficulty with teaching, there was an initial high (5 seconds) level of teacher reprimand and behaviour talk corresponding with the initial equivalent duration per minute of unwanted or competing behaviour – both of which reduced equivalently. This initial 'burst' of reprimand is also apparent for sample N=17, and was probably an artefact of teacher–student social talk at the outset of class and the need to orientate students to task.

For N=53, there was an increase in unwanted behaviour after interval 22. This increase was largely student–student social talk. Truncating the data for the sample N=53 to 22 intervals and introducing a one interval lag on teacher reprimand and behaviour talk combined (to all targets) realised a large relationship and effect size, r=0.797, p<0.001, between teacher reprimands and behaviour talk and student

unwanted or competing behaviour. The corresponding relationship with student on task behaviour was r=-0.554, p< 0.001).

Table 6.3.7 Correlations between the Mean Rates (Seconds per Minute) of all Teacher Task talk, all Teacher Reprimands and Behaviour Talk and the Mean Rates (Seconds per Minute) of Student On-Task Behaviour and Student Unwanted Behaviour with a two Interval Lag on Reprimands for N=17 and a one Interval Lag for N=53

Correlations Between Teacher Task Talk,		**N=17**		**N=53**	
Teacher Reprimands And Behaviour Talk And		on task	unwanted	on task	unwanted
Student On Task And Unwanted Behaviour:		behaviour	behaviour	behaviour	behaviour
all teacher task talk	202/220/221	0.330	-0.370	**0.382**	**-0.374**
all teacher reprimands and behaviour talk	330/304/5/6/7/8/340/350/360	-0.019	**0.567**	-0.089	**0.402**

Correlations in Table 6.3.7 are consistent for both samples in that the same relationships are elevated and of the same valence even if not significantly so. Teacher reprimands and behaviour talk have a moderate to large relationships with student unwanted behaviour for both samples, and all teacher task talk relates moderately and positively with student on-task behaviour and negatively with student unwanted behaviour.

The data for N=53 indicates that a high correspondence between teacher reprimands and behaviour talk and student unwanted behaviour for the first twenty-two minutes of class time whilst maintaining teacher task talk at a high level (greater than 50% of available time) contains student unwanted behaviour sufficiently for student on-task behaviour to persist at a high level over time.

For N=53 (Table 6.3.6) a one interval lag on teacher reprimand and behaviour talk combined realised a moderate relationship, r=0.401, p<0.01, between teacher reprimand and behaviour talk and student unwanted behaviour. The relationship with student on-task behaviour was r= -0.088, indicating a minimal insignificant negative relationship. Given a two interval lag the relationship with student unwanted behaviour was r=-0.353, p< 0.02, with student on-task behaviour r=0.481, p<0.001. With a three interval lag respective correlations were r= -0.158 and r= 0.336, p< 0.02. These results indicate that teacher reprimand and behaviour talk had a moderate to large suppressing effect on student unwanted behaviour and positive effect on student on-task behaviour within a two-interval time frame.

These results indicate that the effectiveness of reprimands and behaviour talk gain in suppressing unwanted behaviour and increasing on-task behaviour is associated with greater rates (rates of 50% of available time) of teacher task talk within and across intervals. That inherently this may limit any of the ongoing negative effects associated with protracted reprimand and re-orientate students to an on-task focus.

Conversely, that low rates (rates of 37% of available time) of teacher task talk within and across intervals results in a loss of significant relationships between teacher task talk and student on-task and unwanted or competing behaviour (N=17). Further that this results in greater variability across all other teacher-student behaviour, particularly in lower rates of student on-task behaviour and greater rates of unwanted or competing behaviour.

Table 6.3.8 Correlations between the Mean Rates (Seconds per Minute) of Student On-Task Behaviour and Student Unwanted Behaviour and the Mean Rates (Seconds per Minute) of Teacher Task Talk Differentiated and Combined

Behaviour:	**Code:**	**Correlation With Student On Task Behaviour:**			
		N=17	**N=53**	**Significance:**	
teacher task talk to whole class	202	0.184	**0.600**	P< 0.001	
teacher task talk to target student	220	0.047	**-0.332**	P< 0.02	
teacher task talk to other	221	0.021	**-0.341**	P< 0.02	
sum of teacher task talk	202/220/221	0.328	**0.382**	P< 0.01	
		Correlation With Student Unwanted Behaviour:			
		N=17	**N=53**	**Significance:**	
teacher task talk to whole class	202	-0.195	**-0.545**	P< 0.001	
teacher task talk to target student	220	-0.004	0.142		
teacher task talk to other students	221	-0.030	**0.330**	P< 0.02	
all teacher task talk	202/220/221	-0.343	**-0.374**	P< 0.01	

Correlations were all higher for teacher verbal behaviour directed toward the whole class (202) compared to the individual student (220).

Summary and Discussion

Consistently, teacher behaviour directed to the target student has been found to not relate to student on-task or student unwanted behaviour. The predominant significant relationships with student on-task and unwanted behaviour are with teacher task talk to the whole class (202) and all teacher task talk (202/220/221). The latter, overall, reduces the relationship and the effect found.

Teacher reprimands and behaviour talk were found to relate significantly to student unwanted behaviour given a one interval lag, indicating congruence with unwanted behaviour (reprimand and behaviour talk being subsequent events) for sample N=53. An additional lag evidenced a significant positive correlation with student on-task behaviour and negative correlation with student unwanted behaviour. This showed reprimand and behaviour talk to be an effective intervention given the maintenance of a high level of teacher task talk (greater than 50% of available time).

For sample N=17, with considerably less teacher task talk (37% of available time), all behaviour measured was considerably more variable and the relationships between teacher task talk and teacher reprimand and behaviour talk were lost.

Maintaining a high rate of teacher task talk that is public in nature (202, 202/220/221) 'depersonalises' reprimand and behaviour talk and makes it more congruent with established research-based principles for effective punishment. For sample N=53, for the first 22 minutes (intervals) of class, immediacy of punishment was high, contingency as evidenced by congruence or contiguity with a one interval lag was high, it was limited in time, the schedule was continuous and demand characteristics for alternative, on-task behaviour continuous (Lerman & Vorndran, 2002; Spradlin, 2002) and were well-established beforehand (MacMillan et al., 1973).

'… planned socially mediated punishment is implemented frequently by untrained individuals. Parents, teachers, and judges, among others, implement punishment—or at least what they believe to be punishment—for the expressed purpose of decreasing problematic behaviour. These individuals cannot possibly know or understand the optimal conditions under which their procedures would be effective (no one does), (Vollmer, 2002, p.470). Given the described relationships or parameters regarding teacher task talk, the need to understand the principles for effective punishment and the ability to continually discriminate sufficiently and apply differentiated interventions contingently and consistently become unnecessary – the imperative becomes increasing the rate (seconds per minute) of teacher task talk. Maintaining ongoing task talk is a considerably simpler and more practicable proposition in the classroom (or home) setting than selective attention

or ‘planned ignoring’ and is well within the repertoires of teachers (and parents) without especial training.

Cannella, O’Reilly and Lancioni (2006) in their literature review noted a “shift away from aversive interventions in the last ten years” (p. 529). This trend towards non-aversive treatment of behaviour problems has gained momentum over time (Beaman and Wheldall, 2000). Based on the current study, this trend is to the detriment of classroom management and maintaining high rates of student on-task behaviour.

For sample N=17, with considerably less teacher task talk (37% of available time), all behaviour measured was considerably more variable and the relationships between teacher task talk and teacher reprimand and behaviour talk were lost. It is this scenario that perhaps relates to the conclusions reported by Madsen, Becker, Thomas, Koser and Plagers (1968) findings that reprimands are ineffective as punishers in the classroom setting, that they may serve to increase some problem behaviour, and that approval for appropriate behaviour was probably salient for decreasing problem behaviour and increasing academic performance are not supported by the current findings. Madsen, Becker, Thomas, Koser and Plager (1972) reported a reluctance for teachers to ignore inappropriate behaviour, a view shared and endorsed by Swinson and Harrop, (2001, p.730), who see this as potentially “dangerous to class dynamics.” In the writer’s view a continued high rate of teacher task talk (i.e. ‘running a narrative’) is a more effective and practicable strategy than ‘planned ignoring’ in that it inherently both ‘ignores’ individual errantry and continues a work focus. The moderate to large relationships and effect sizes found with respect to teacher behaviour to the whole class, the target student and other students combined, in contrast to the insignificant relationships found between teacher behaviour directed to the target student, indicate that ‘contagion’ or commonality of student behaviour at any given time indicates ‘contagion’ to be a fundamental characteristic of classroom behaviour – the ‘whole’ is salient.

Table 6.3.9 Correlations between the Mean Rates (Seconds per Minute) of Teacher Reprimand and Behaviour Talk and the Mean Rate (Seconds per Minute) of Praise for Work and Behaviour for the Principle Samples for all Data Combined and Differentiated

Correlation Of All Teacher Reprimand With All Teacher					
Praise For Work And Behaviour:		**Praise Work**	**Praise Behaviour**	**All Teacher Praise**	
Samples:	correlation of 207/70/71 with	205/50/51	206/60/61	205/50/51/206/60/61	Significance:
Primary, N=6		0.016	0.150	0.235	
Intermediate, N=32		0.247	**0.356**	0.007	P< 0.05
Secondary, N=29		-0.017	-0.068	0.149	
N=17		-0.035	-0.043	**-0.493**	P< 0.05
N=53		**-0.359**	**0.437**	-0.031	P< 0.01
All Data Combined, N=72		-0.055	0.115	-0.116	

Greater correlations would be expected between teacher reprimand and praise for behaviour than for teacher praise for work, reprimand predominantly being delivered for issues of conduct. The moderate positive relationship between teacher praise for behaviour and reprimand, for Intermediate data and sample N=53, indicate a symbiosis, be it to offset the impact of reprimand and prescribing expected behaviour, or indication of potential ensuing reprimand. This contention is supported by the finding that when teacher praise for work and behaviour combined were lagged relative to student on-task behaviour (i.e. treating it as a subsequent event), no relationships were found.

Numerous studies have successfully combined praise for appropriate behaviour with reprimands for inappropriate behaviour (for example McAllister et al., 1969). The postulation that praise and punishment are functionally related in this manner was supported by the significant relationship found between the two by incidents per minute, however, not by seconds per minute of occurrence. The relationship found between teacher praise for work and behaviour and teacher reprimand and behaviour talk suggest that praise is used to 'offset' reprimand and behaviour talk by incidence, not by time (Section 5.1).

"Punishment will produce a greater reduction in response rate if an unpunished alternate response is available…and if that response is reinforced on a schedule equal to or greater than reinforcement for the punished response." (Spradlin, 2002, p. 475). This showed reprimand and behaviour talk to be an effective intervention given the maintenance of a high level of teacher task talk (greater than 50% of available time). This is '*maintaining the availability of* an unpunished alternative response.'

For sample N=17, with considerably less teacher task talk (37% of available time), all behaviour measured was considerably more variable and the relationships between teacher task talk and teacher reprimand and behaviour talk were lost.

Teacher task talk to the whole class and teacher reprimand were the most significant variables found regarding gaining and maintaining high rates of student on-task behaviour.

Teacher proximity to the target student did not relate with teacher reprimand or behaviour talk directed to the target student in any analysis.

All teacher reprimands and behaviour talk were found to relate moderately to student unwanted behaviour given a one interval lag, indicating congruence with unwanted behaviour (reprimand and behaviour talk being subsequent events) for sample N=53. An additional lag evidenced a moderate positive relationship with student on-task behaviour and negative relationship with student unwanted behaviour. This showed reprimand and behaviour talk to be an effective intervention given the maintenance of a high level of teacher task talk (greater than 50% of available time).

Hypothesis H_3, that there are significant relationships between rates of teacher task talk, teacher reprimands and behaviour talk and student unwanted or competing behaviour, and student on-task behaviour in classroom settings is strongly supported by the results in this section.

Hypothesis H_3 A high rate of teacher task talk is the defining condition under which reprimands and behaviour talk reduce student unwanted or competing behaviour and maintain a high rate of student on-task behaviour. *This was evident in fewer reprimands and behaviour talk, in reprimands and behaviour talk being of shorter duration, greater association of reprimand and behaviour talk with unwanted behaviour, and subsequently, a significant negative relationship between teacher reprimands and behaviour talk and student unwanted behaviour, and a significant positive relationship with student on-task behaviour, for those teachers evidencing high rates of teacher task talk. This indicating a conditional functional relationship.*

Reprimand and behaviour talk are analysed severally and combined. Behaviour talk, or talk about conduct, is often sequalae to, or is used as an alternative to reprimand.

6.4 Teacher Social Talk

Introduction

"The frequency of and repetitive nature of problems within classes has seen the focus put on 'who is being taught and not on what is being taught (Engelman,1980,p.35) and has consequently sought to isolate related ethnographic factors and moved the focus from teacher instruction, curriculum presentation and management." This observation is further emphasised by a project seeking to investigate … what was involved in improving student educational achievement (Te Kotahitanga, 2003). Bishop and associates reported that, "the students identify the major influences on their educational achievement as being the relationships they have with their teachers; some 81% of the total student utterances can be located within this discourse" (p.8). But what constitutes a 'positive' relationship that will improve student educational achievement?

Solomon & Kendall (1976), as cited in Rosenshine, 1980 indicated that "permissiveness, spontaneity and lack of classroom control were negatively related, not only to achievement gain, but also to positive growth in creativity, inquiry, writing ability, and self-esteem for the students in those classrooms" (p18), Effective school practices, Vol.18, No. 1, 1999).

This Section is included as teacher social talk by its very nature is the teacher initiating behaviour directly competing with academic pursuit.

Results

Teacher social talk is analysed in respect to all data combined (Section 5.3) and in respect to those teachers having expressed management difficulty (N=17) and those not having done so (N=53, Section 5.4).

Teacher social talk within class characteristically results in reprimand and behaviour talk or other emphatic direction to re-orientate students to task.

The moderate to large positive relationship ($r=0.409$, $p<0.001$) obtained between all teacher social talk and all teacher reprimands and behaviour talk, for all data combined, confirms such a relationship (Table 6.4.1). A similar, although large, relationship was found for the sample N=53 ($r=0.530$, $p<0.001$), but not for N=17 ($r=0.160$).

Table 6.4.1 Correlations between the Mean Rates (Seconds per Minute Teacher) Social Talk Differentiated by Target and Mean Rates (Seconds per Minute) of Teacher Reprimand and Behaviour Talk for Samples N=17, N=53 and all Data Combined (N=72)

Correlations Between Teacher Social Talk				
To Students Differentiated And Teacher			**Samples:**	
Reprimand And Behaviour Talk:	**Behaviour Code:**	**N=17**	**N=53**	**All Data**
teacher social talk to whole class	204	-0.198	**0.447**	**0.391**
teacher social talk to target student	240	0.065	0.066	-0.086
teacher social talk to other students	241	-0.155	**0.419**	**0.276**
all teacher social talk	204/240/241	-0.218	**0.530**	**0.409**

Differentiating the data further in respect to reciprocal teacher-student social talk ('opportunities to respond') for those teachers who had expressed difficulty with classroom management (N=17) those who had not (N=53) and all data combined, all teacher social talk combined (204/240/241), to the class, to the target student and to other students summed was greater for sample N=53 (1.188 seconds per minute) than N=17 (0.822 seconds per minute) and dispersed over all intervals (Table 6.4.2).

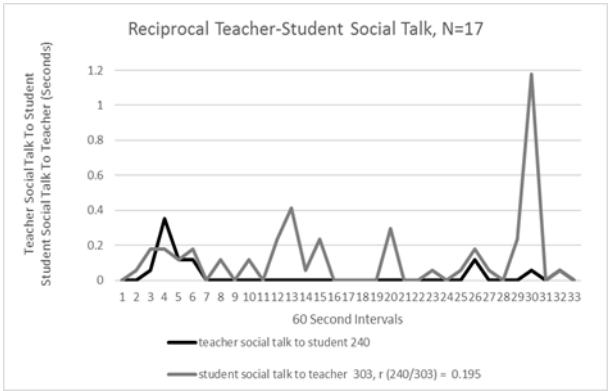
That teacher social talk occurs at a greater rate for those teachers not having expressed any difficulty with their teaching practice, is surprising as teacher social talk is the proactive pursuit of competing behaviour. Presumably this should be seen in respect to pursuing 'grander' goals such as improved teacher student relationships.

Differences between teacher social talk to the target student between samples is minimal, target student social talk to the teacher for N=17 is however almost five times greater than for N=53 (6.023 seconds per minute). This differential is not repeated in respect to student task talk to other students (Table 6.4.2).

Table 6.4.2 Mean Rates (Incidents and Seconds per Minute) of Reciprocal Teacher–Target Student Social Talk and Teacher–Student Task Talk for Samples N=17, N=53, and all Data Combined, N=72

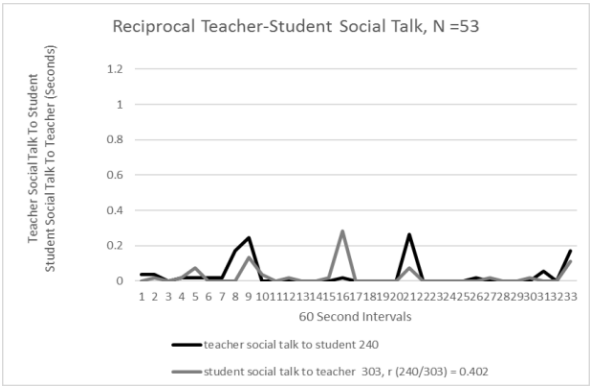
Reciprocal Teacher-Student Social Talk							
Behaviour:	**Code:**		**Samples:**				
		N=17		**N=53**		**All Data**	
		seconds/minute	**incidents/minute**	**seconds/minute**	**incidents/minute**	**seconds/minute**	**incidents/minute**
teacher social talk to student	240	0.026	0.212	0.033	0.393	0.025	0.454
student social talk to teacher	303	0.121	0.576	0.025	0.364	0.047	0.697
teacher social talk to other student	241	0.232	0.909	0.61	1	0.491	1
student social talk to other student	330	6.023	1	2.106	1	2.973	1
all teacher social talk	204/240/241	0.822	0.970	1.188	1.000	1.046	1
Reciprocal Teacher-Student Task Talk							
Behaviour:	**Code:**		**Samples:**				
		N=17		**N=53**		**All Data**	
		seconds/minute	**incidents/minute**	**seconds/minute**	**incidents/minute**	**seconds/minute**	**incidents/minute**
teacher task talk to student	220	1.215	0.969	1.034	1	1.048	1
student task talk to teacher	302	0.696	0.939	0.489	1	0.524	1
teacher task talk to other student	221	7.761	1.000	12.577	1.000	11.090	1
student task talk to other student	320	0.713	0.576	1.647	1.000	1.380	1
all teacher task talk	202/220/221	22.283	1	30.392	1	27.633	1

Teacher social talk to the target student is equivalent across samples (Table 6.4.2). There is a considerably greater focus on teacher task talk for N=53 and all data combined.



r= 0.195

Figure 6.4.1 Mean Rate (Seconds per Minute) Reciprocal Teacher-Student Social Talk, for N=17



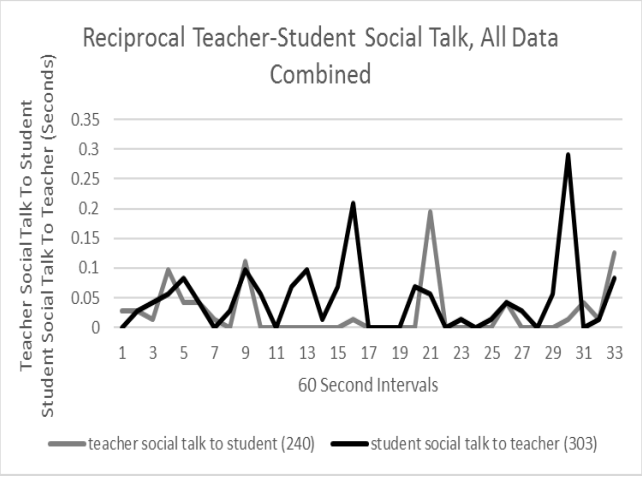
r=0.402, p< 0.01

Figure 6.4.2 Mean Rate (Seconds per Minute) of Reciprocal Teacher-Student Social Talk, for N=53

The protracted reciprocal teacher–student social talk at the beginning of class for N=17 indicates that engaging in social talk at the outset of class is characteristic for a number of classes. N=53, shows a more reciprocal and hence controlled scenario ($r=0.402$, $p<0.01$). There is an indication of student perseverative behaviour at the beginning of class for N=53, this is more pronounced with teachers having trouble (N=17).

The high of rate (seconds per minute) of teacher social talk at the beginning of class for N=17 was succeeded by a continued high rate of student initiated social talk to the teacher independent of a social talk response from the teacher (perseverative behaviour). The lack of correlation between the two indicates this lack of congruence (reciprocity and control).

By comparison, Figure 6.4.2. Indicates a close relationship between the two behaviours for N=53 the duration of such being considerably less than for sample N=17.



r= 0.160

Figure 6.4.3 Mean Rate (Seconds per Minute) of Reciprocal Teacher–Student Social Talk for All Data Combined, N=72

When the data was combined (Figure 6.4.3), again there was little congruity between teacher–student task talk.

Summary and Discussion

No relationships were found between teacher social talk to the target student severally or to all targets combined and student on-task behaviour and student unwanted behaviour for samples N=17, N=53 or all data combined. This indicates no overall deleterious effects on those behaviours. Implicitly, however, that social talk detracts from on-task behaviour, it is a competing behaviour. These results are confounded by attention to teacher talk (social and task related) being defined as on-task behaviour such that differentiation of attending to teacher being task related, social or conversation related or behaviour talk related may have resulted in different findings regarding generalisation.

The significant correlations found between teacher social talk to the whole class, to other students, and all teacher social talk to all targets combined, and teacher reprimand and behaviour talk for N=53 and all data combined strongly indicate it cannot be viewed as contributing positively to teaching or teacher–student relationships. The perseverative nature of student social talk to the teacher for N=17, in the absence of teacher response is consistent with this view.

The association with reprimand and behaviour talk, indicate that teacher social talk cannot be seen as relationship enhancing, some effort is subsequently required to re-establish a work focus.

Engaging in social talk at the outset of class is characteristic for a considerable number of classes, and is often associated with continuing student social talk independent of teacher reciprocation. This is more pronounced in those classes in which teachers described having management difficulty.

There is greater homogeneity with academic skills in a class than there is with social skills.

Whilst students may view the relationships they have with their teachers as a major influence on their educational achievement (Bishop et al, 2003), teacher social talk within class cannot be seen as contributing positively to this relationship.

Rosenhine (1980), in his review of those factors contributing to effective teaching practice stated that, “A strong focus on the academic was found to be characteristic of effective teachers. Non-academic activities, while perhaps enjoyable or directed at other educational goals, were consistently negatively correlated with achievement. Teacher-centred rather than student-centred classrooms had higher achievement rates.” (p18. Effective school practices, vol.18, No. 1, 1999).

The results in the present study on teacher–student social talk is in accord with these findings. That teacher social talk within class is unlikely to enhance teacher-student relationships nor student academic achievement – it essentially involves teacher, if not initiated, then associated, distraction, often with ensuing negative consequences (reprimand and behaviour talk). All classes began with teacher-student and student-student social talk and reprimand and behaviour talk.

6.5 Teacher Proximity to the Target Student

Introduction

Teacher proximity to the target student is a simply effected strategy that has been shown to enhance classroom management – ‘teacher movement in the classroom may effectively control student disruptions by bringing the teacher into closer proximity to all students, thereby increasing the effectiveness of their interactions with students’ (Gunter, Shores, Jack, Rasmussen and Flowers, 1995 p.12).

Frequent teacher movement patterns around the classroom, of which teacher proximity in part reflects, has also been shown to enhance classroom management (Evertson, 1989; Lewis and Sugai, 1999; Shores, Jack et al., 1993; Gunter, Shores et al., Catapano, 2015).

1995; Sutherland, 2008). More specifically, teacher proximity has been shown to make praise and reprimand more effective (Van Houten et al., 1982; Pfiffner et al., 1985 and Forehand et al.,1987).

In the current study, teacher proximity to the target student was recorded when the teacher was within six foot of the target student in 72 classroom sessions with 26 teachers and 63 students across year rates 2 to 13.

Results

When viewed differentially (all data combined, Primary, Intermediate and Secondary School, teachers who had expressed management difficulty and those who had not) teacher proximity to the target student occurred in almost all observation intervals (every minute).

Teacher Proximity to the Target Student for All Data Combined

When all data was combined, teacher proximity was 8.077 seconds per minute (Table 6.5.1).

Those teachers who had expressed management difficulty were proximal to the target student slightly less than once per minute and 1.589 seconds less per minute than their cohorts who had not expressed such difficulty (Table 6.5.1).

Table 6.5.1 Mean Rates (Incidents and Seconds per Minute) of Teacher Proximity to the Target Student for all Data Combined (N=72), and Differentially for those Teachers with Expressed Management Difficulty (N=17) and Others (N=53) and Primary, Intermediate and Secondary School

Teacher Proximity To Target Student (Code: 201):	Sample Size:	time/min	incidents/min
All Data Combined	N=72	8.077	1.000
Primary School (year 2-6):	N=6	18.215	0.921
Intermediate School (year 7 and 8):	N=32	9.509	0.971
Secondary School (year 9-13):	N=29	4.536	1.000
Teachers Experiencing Difficulty:	N=17	6.592	0.970
All Other Teachers:	N=53	8.181	1.000

When the differentiated data for Primary (years 2–6), Intermediate (years 7 and 8) and Secondary Schools (years 9–13) 18.215, 9.509 and 4.536 seconds per minute respectively, is considered, time in close proximity reduces by almost half with the respective year rates. This may be an artefact of both greater teacher and /or student mobility and the greater use of group based instruction within junior classes. Intermediate data reflects the transition from group teaching, to whole class

instruction which predominates in Secondary Schools. Most classes in the Intermediate Section used whole class instruction alone, three did not. The dispersion of teacher proximity across intervals for the different sectors indicates that teacher proximity is equivalent across all data groupings (Table 6.5.1).

Table 6.5. 2 shows teacher behaviour directed to the target student, the incidents and time spent (seconds per minute), and the correlation of these with teacher proximity to the target student for all data combined (N=72).

Table 6.5.2 Mean Rates of Teacher Behaviour Directed to the Target Student (Incidents and Seconds per Minute) and Correlations with the Mean Rate (Seconds per Minute) of Teacher Proximity to the Target Student for All Data Combined, N=72

N=72					
Behaviour:	**Behaviour Code:**	**seconds per minute**	**incidents per minute**	**correlation:**	**Significance:**
student on task	301	43.674	1.000	0.085	
student task talk to teacher	302	0.524	1.000	-0.046	
student task talk to other students	320	1.380	1.000	-0.016	
sum of student on task	301/302/320	45.579	1.000	0.085	
teacher praise target student for work	250	0.050	0.909	-0.059	
teacher praises student for behaviour	260	0.014	0.545	-0.174	
teacher reprimands target student	270	0.063	0.909	0.114	
teacher task talk to target student	220	1.048	1.000	0.068	
teacher behaviour talk to target student	230	0.074	0.848	**-0.350**	**P<0.01**
	240	0.025	0.455		
teacher reprimand and behaviour talk to target student	270/230	0.136	1.000	-0.206	
student unwanted or competing behaviour	330/304/5/6/7/8/340/350/360	3.386	1.000	-0.104	
	308	0.056	0.303	**-0.441**	**P<0.001**

No relationships were found between teacher proximity to the target student and teacher verbal behaviour directed to the target student.

Moderate negative relationships were found between teacher proximity and teacher behaviour talk (230) to the target student, and for target student repetitive movements (308).

The obtained moderate negative relationship between teacher proximity to the target student and teacher behaviour talk to them ($r=-0.350$, $p<0.01$) indicates the public nature of such talk. This is not what was expected from the research indicating that teacher proximity enhances the effectiveness of praise and reprimands, although teacher behaviour talk is a frequent adjunct to reprimand. This strategy has not been used by these teachers in any systematic manner despite teacher proximity occurring at quite a high rate. The moderate to large negative relationship between the target student engaging in repetitive movements and

teacher proximity ($r=-0.441$, $p<0.001$) is consistent with the nature or occurrence of such behaviour i.e. it is more likely to occur when the teacher is more distant.

The lack of relationship between teacher proximity to the target student and most teacher–student directed behaviour indicates that teacher proximity is generally not used as a management strategy to enhance the impact of other teacher verbal behaviour such as task talk, for maintaining student on-task behaviour or suppressing unwanted behaviour. This is surprising given the rate of teacher proximity to the target student (8.077 seconds per minute).

It may be that frequent non-contingent proximity is a sufficiently effective management strategy alone in that it circumvents a need for a contingent association.

Teacher Proximity to the Target Student across Year Rates

Teacher proximity to the target student (seconds per minute) varied markedly over year rates, ranging from 3.309 seconds per minute in year 11 to 21.410 seconds per minute in year 5 and 6 (Table 6.5.3).

The dispersion (incidents per minute) across intervals is quite stable, the range being from 0.273 to 0.970 incidents per minute. The relationship between the two, seconds per minute and incidents per minute, are shown in Figure 6.5.1.

Table 6.5.3 Mean Rates (Incidents and Seconds per Minute) of Teacher Proximity to the Target Student across Year Levels

						Year Level:					
Teacher Proximity To The Target Student (201):	**Behaviour Code:**	**year 2**	**year 3**	**year 4**	**year 5 & 6**	**year 7 & 8**	**year 9**	**year 10**	**year 11**	**year 12**	**year 13**
teacher proximity to the target student	incidents per minute, 201	0.273	0.786	0.452	0.692	0.971	0.478	0.727	0.352	0.865	0.519
teacher proximity to the target student	seconds per minute, 201	14.045	20.321	9.286	21.410	9.509	2.457	4.321	3.309	8.592	10.630

Table 6.5.4 Correlation of the Mean Rates (Seconds per Minute) of Teacher Proximity to the Target Student (201) and Mean Rates (Seconds per Minute) of Teacher Behaviour Directed to the Target Student, and Student On-Task and Unwanted Behaviour, across Year Levels

Correlation Of Teacher Proximity To The											
Target Student With Teacher Behaviour To	**Data Points Within Samples:**	**44**	**42**	**42**	**39**	**34**	**46**	**55**	**54**	**52**	**54**
The Target Student And Student On Task And	95% confidence levels for 220	0.05	0.1		0.05		0.001		0.01	0.05	0.001
Unwanted Behaviour.	**Sample Size:**	**N=1**	**N=2**	**N=1**	**N=2**	**N=32**	**N=5**	**N=7**	**N=3**	**N=6**	**N=3**
Behaviour:	**Behaviour Code:**	**year 2**	**year 3**	**year 4**	**year 5 & 6**	**year 7 & 8**	**year 9**	**year 10**	**year 11**	**year 12**	**year 13**
teacher task talk to target student	220	**0.343**	0.292	0.094	**0.362**	0.262	**0.601**	0.274	**0.367**	**0.308**	**0.640**
teacher behaviour talk to target student	230	-0.040	0.000	0.000	0.000	-0.262	-0.125	-0.043	0.088	0.220	0.000
teacher social talk to target student	240	0.000	0.000	0.000	0.119	0.086	-0.121	0.000	0.107	0.072	0.056
teacher praises work of target student	250	0.000	0.210	0.091	0.000	0.089	0.150	**0.280**	0.012	0.093	0.207
teacher praises behaviour of target student	260	0.000	0.269	0.000	-0.012	0.109	0.046	0.168	0.032	0.040	0.109
teacher reprimands target student	270	0.000	-0.122	0.080	0.000	0.028	-0.102	0.068	0.206	0.103	0.000
teacher praise for work and behaviour	250/260	0.000	0.265	0.091	-0.012	0.121	0.142	0.313	0.024	0.098	0.235
teacher reprimand and behaviour talk	230/270	-0.015	-0.122	0.086	0.000	-0.183	-0.124	0.110	0.140	0.216	0.000
student task talk with teacher	302	**0.349**	0.239	**0.881**	0.109	-0.216	**0.395**	0.194	**0.436**	0.240	**0.367**
student on task behaviour	301/302/320	**0.384**	-0.076	**-0.373**	-0.097	0.052	0.143	0.245	0.063	**-0.294**	0.163
student unwanted or competing behaviour	330/305/6/7/8/340/350/360	**-0.307**	-0.009	0.174	-0.035	-0.080	-0.140	-0.128	-0.092	**0.256**	**-0.253**

Relationships between teacher proximity to the target student (201) and teacher task talk to the target student (220) were elevated or significant across all year rates except year 4. Student task talk to the teacher was similarly significantly related to teacher proximity or elevated. This indicates that teacher proximity is associated with task talk to a target student although this is not replicated when all the data is combined.

No further significant correlations were found between teacher behaviour to the target student and proximity to them that would indicate characteristic behaviour. Teacher proximity was not significantly related to student on-task behaviour or student unwanted behaviour.

Figure 6.5.1. Shows the change in rate (seconds per minute) of teacher proximity to the target student over year rates. It clearly demarks the differences between Primary (years 2 to 5 and 6), Intermediate (years 7 and 8) and Secondary year rates (years 9 to 13).

The dispersion (incidents per minute) across intervals is quite stable even given the reduction in time (seconds per minute), the range being from 0.273 to 0.970 incidents per minute.

Whilst teacher proximity decreases in year 7 and 8 and remains depressed relative to earlier year rates (seconds per minute), the percentage of teacher and student task talk to the target student associated with teacher proximity increases over the same year rates (Figure 6.5.2, Table 6.5. 5). Teacher task talk is dominant across all year rates.

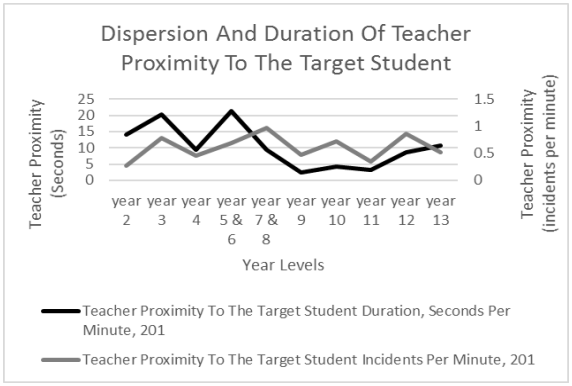


Figure 6.5.1 The Mean Rate (Incidents and Seconds per Minute) of Teacher Proximity to the Target Student across Year Levels

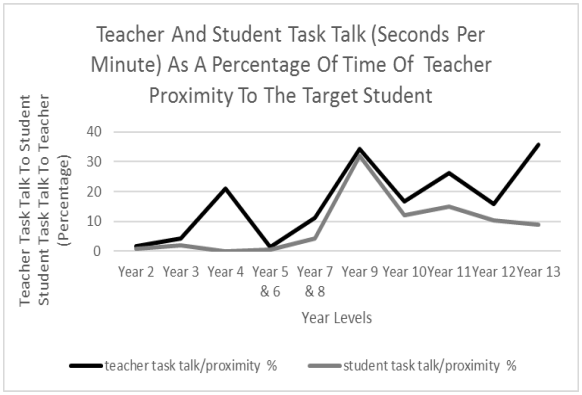


Figure 6.5.2 The Mean Rate (Seconds per Minute) of Teacher and Student Reciprocal Task Talk as a Percentage of the Mean Rate (Seconds per Minute) of Teacher Proximity to the Target Student across Year Levels

Table 6.5.5 The Mean Rates (Seconds per Minute) of Reciprocal Teacher - Target Student Task Talk as a Percentage of Mean rates of Teacher Proximity to the Target Student (Seconds) across Year Levels

Teacher And Student Reciprocal Task Talk											
As A Percentage of Teacher Proximity To The				**Year Level:**							
Target Student (Seconds):	**Behaviour Code:**	**Year 2**	**Year 3**	**Year 4**	**Year 5 & 6**	**Year 7 & 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**
teacher task talk as a percentage of proximity	220 as percentage of 201	1.780	4.335	21.022	1.378	11.189	34.317	16.707	26.295	15.911	35.824
student task talk as percentage of proximity	302 as percentage of 201	0.809	1.992	0.000	0.599	4.301	31.858	12.137	14.832	10.352	8.827

These results indicate that teacher proximity to the target student is functionally related to task talk to an increasing extent over year rates.

Teacher Proximity to the Target Student across Primary, Intermediate and Secondary Schools

Table 6.5.6 The Mean Rates (Incidents and Seconds per Minute) of Teacher Proximity to the Target Student and Mean Rates (Incidents and Seconds per Minute) of Target Student Behaviour across Primary, Intermediate and Secondary Schools

Teacher Proximity To Target Student		**Primary:**		**Intermediate:**		**Secondary:**	
duration and dispersion of teacher/student behaviour:		**time/min**	**incidents/min**	**time/min**	**incidents/min**	**time/min**	**incidents/min**
proximity	201	18.215	0.921	9.509	0.971	4.536	1.000
student on task	301	49.711	1.000	45.219	1.000	44.835	1.000
target student task talks with teacher	302	0.132	0.289	0.409	1.000	0.761	0.970
target student task talks with other students	320	1.886	0.816	1.656	1.000	1.067	1.000
sum of student on task	301/302/320	51.728	1.000	47.284	1.000	46.662	1.000
teacher praises work of target student	250	0.026	0.105	0.063	0.824	0.045	0.545
teacher praises behaviour of target student	260	0.009	0.053	0.014	0.353	0.017	0.273
teacher reprimands target student	270	0.044	0.132	0.073	0.706	0.063	0.606
teacher task talk to target student	220	0.750	0.474	1.064	1.000	1.214	0.970
teacher behaviour talk to target student	230	0.013	0.053	0.116	0.765	0.050	0.455
teacher social talk to target student	240	0.013	0.053	0.030	0.324	0.697	0.091
teacher reprimand and behaviour talk to target student	270/230	0.057	0.158	0.188	0.912	0.113	0.727
student unwanted or competing behaviour	330/305/6	1.443	0.816	3.309	1.000	4.300	1.000
student repetitive movements	308			0.053	0.147	0.078	0.182

Table 6.5.6 shows teacher proximity, duration and incidence, relative to other teacher and student behaviour. It is the largest teacher directed behaviour to the target student.

Table 6.5.7 Mean Rates (Incidents and Seconds per Minute) of Teacher Proximity to the Target Student across Primary, Intermediate and Secondary Schools

Teacher Proximity To Target Student, duration (Seconds)	Code:	Primary:		Intermediate:		Secondary:	
and dispersion of teacher/student behaviour:		time/min	incidents/min	time/min	incidents/min	time/min	incidents/min
proximity	201	18.215	0.921	9.509	0.971	4.536	1.000
teacher task talk to target student	220	0.750	0.474	1.064	1.000	1.214	0.970
sum of student on task	301/302/320	51.728	1.000	47.284	1.000	46.662	1.000

Teacher Proximity To Target Student (Code: 201):	Sample Size:	time/min	incidents/min
Primary School (year 2-6):	N=6	18.215	0.921
Intermediate School (year 7 and 8):	N=32	9.509	0.971
Secondary School (year 9-13):	N=29	4.536	1.000

Teacher proximity to the target student (seconds per minute) was high across all school types. The mean time reduced by approximately half from Primary to Intermediate School and by half again to Secondary School. Despite the reduction, teacher proximity to the target student occurred almost equivalently across schools, occurring once in every 60 second interval (incidents per minute, Table 6.5. 7).

Teacher proximity is moderately negatively related with student on-task behaviour ($r=-0.441$, $p<0.01$) and positively related (a large relationship and effect size) with teacher–student ($r=0.844$, $p<0.001$) and student–teacher task talk (moderately so, $r= 0.426$, $p<0.05$) for Secondary students alone.

Teacher proximity was not significantly related to unwanted or competing behaviour across the different school groupings although all relationships were negative.

The high rates (seconds per minute) of teacher proximity to the target student, particularly in Primary School suggests that proximity, if it does have an effect it is as a non-contingent preventative measure (given that teacher reprimands constitutes 70.957 per cent of teacher reprimands and behaviour talk combined which occurs at the rate of 2.031 seconds per minute (Table 6.5.5) and or discriminative stimulus for student on-task behaviour. The relationship between teacher proximity and student on-task behaviour is minimal, similarly for Primary

and Intermediate Schools, significantly negative for Secondary Schools, or related significantly, as is the case with Secondary School data to teacher–student task talk.

Table 6.5.8 The Mean Rate (Seconds per Minute) of Teacher Proximity to the Target Student Correlated with the Mean Rate (Seconds per Minute) of Teacher and Target Student Behaviour across Primary, Intermediate and Secondary Schools

Teacher Proximity To Target Student		**Primary:**	**Intermediate:**	**Secondary:**	**Significance:**
Correlations with teacher and student behaviour:		**N=6**	**N=32**	**N=29**	
student on task	301	0.316	0.105	**-0.441**	**P< 0.01**
target student task talks with teacher	302	0.168	-0.216	**0.426**	**P<0.05**
target student task talks with other student	320	-0.164	-0.126	0.287	
all student on task behaviour	301/302/320	0.295	0.052	-0.302	
teacher praises work of target student	250	-0.085	0.089	0.301	
teacher praises behaviour of target student	260	0.220	0.109	-0.058	
teacher reprimands target student	270	0.262	0.028	0.094	
teacher task talk to target student	220	0.086	0.262	**0.844**	**P< 0.001**
teacher behaviour talk to target student	230	0.212	-0.262	-0.030	
teacher social talk to target student	240	0.219	0.086	-0.039	
teacher reprimand and behaviour talk to target student	270/230	0.295	-0.183	0.045	
student unwanted or competing behaviour	330/305/6/7/8/340/350/360	-0.375	-0.080	-0.026	
student repetitive movements	308		-0.057	-0.103	

Student on-task behaviour related negatively ($r=-0.441$, $p<0.01$) with teacher proximity for Secondary School data. This relationship may indicate an 'if they're working, leave well enough alone' attitude.

The moderate to large positive reciprocal relationships between teacher task talk to the target student ($r=0.844$, $p<0.001$) and student task talk to the teacher ($r=0.426$, $p<0.05$) indicate teacher–student mobility in regard to assaying an individual's work, providing feedback and further individual direction.

Effectively maintaining order and application to task in a class predominantly using group teaching practice requires well established independent work skills in the student – essentially for most of the class, the teacher is out of the class, whilst being in the class. For Primary School classes, such independent work skills are less developed than in Intermediate or Secondary School classes which makes the respective times for student on-task behaviour 51.728, 47.284 and 46.662 seconds per minute (Table 6.5. 3) surprising.

There were no further significant relationships. This is surprising given the predominant group teaching practices adopted particularly within Primary Schools. This data suggests that even within group, there is no substantive (significant)

relationship between teacher proximity and student behaviour, be it wanted or unwanted behaviour, that teacher proximity functions largely as a non-specific discriminative stimulus for work or 'good' conduct.

Teacher Proximity to the Target Student for One Student and Two Teachers

The moderate relationship between teacher 2004 proximity to the target student with student unwanted or competing behaviour ($r=0.377$, $p<0.001$) indicates that proximity in this instance is not associated with any reduction in such behaviour, rather indicates that proximity, to an extent, is a discriminative stimulus for unwanted behaviour. This is consistent with the expressed and observed data for this teacher.

The moderate relationship for teacher 2005 proximity to the target student and reprimand and behaviour talk to them ($r=0.382$, $p<0.001$) and the resultant suppression of student unwanted behaviour is consistent with the literature indicating that such proximity enhances the effectiveness of reprimands and classroom management (Evertson, 1989; Lewis and Sugai, 1999; Shores, Jack et al., 1993; Gunter, Shores et al., 1995), albeit that teacher reprimand to the target student occurred on only the one occasion.

Teacher proximity to the target student was positively related with teacher task talk to the target student for both teachers. This was not the case for student on-task behaviour.

Teacher Proximity to the Target Student for Teachers with Expressed Management Difficulty (N=17) and Others (N=53)

No relationships were found between teacher proximity to the target student (201) and any teacher behaviour directed to the target student for either N=53 or N=17. Student repetitive movements related moderately and negatively with teacher proximity ($r=-0.303$, $p<0.05$). The same relationship, although not

significant and of positive value, for N=17 was more elevated than any other (r=0.360). The lack of relationship is surprising given the rate (seconds per minute) of teacher proximity to the target student although it may well be that the function is something that is not being measured in the current study, for example, maintaining public visibility, maintaining oversight of student work without further participation, or retaining a focal non-contingent presence. The elevated rates of teacher proximity are indicative of teacher mobility in the classroom.

For those teachers with expressed management difficulty (N=17) and others (N=53) no relationships were apparent between teacher proximity to the target student and student behaviour (Table 6.5. 9).

Table 6.5.9 The Mean Rates (Incidents and Seconds per Minute) of Teacher Proximity Differentiated into those Teachers with Expressed Management Difficulty (N=17) and Others (N=53)

Teacher Proximity To Target Student, N=53					
Behaviour:	**Behaviour Code:**	**time/min**	**incidents/min**	**correlation:**	**Significance:**
student on task	301	46.895	1.000	-0.080	
target student task talks with teacher	302	0.489	1.000	0.186	
target student task talks with other students	320	1.647	1.000	**-0.346**	**P<0.05**
sum of student on task	**301/302/320**	49.030	1.000	-0.141	
teacher praises target student for work	250	0.057	0.788	0.155	
teacher praises target student for behaviour	260	0.009	0.242	0.070	
teacher reprimands target student	270	0.028	0.606	0.260	
teacher task tralk to target student	220	1.034	1.000	0.076	
teacher behaviour talk to target student	230	0.030	0.606	0.052	
teacher social talk to target student	240	0.033	0.394	-0.076	
student unwanted or competing behaviour	330/305/6/7/8/340/350/360	2.363	1.000	0.073	
student repetitive movements	308	0.033	0.121	**-0.304**	**P<0.05**

Teacher Proximity To Target Student, N=17				
Behaviour:	**Behaviour Code:**	**time/min**	**incidents/min**	**correlation:**
student on task	301	34.831	1.000	0.302
target student task talks with teacher	302	0.697	0.939	-0.030
target student task talks with other students	320	0.713	0.576	-0.262
sum of student on task	301/302/320	36.241	1.000	0.235
teacher praises target student for work	250	0.066	1.000	-0.157
teacher praises target student for behaviour	260	0.030	0.364	-0.158
teacher reprimands target student	270	0.178	0.758	0.154
teacher task tralk to target student	220	1.216	0.970	0.197
teacher behaviour talk to target student	230	0.217	0.758	0.018
teacher social talk to target student	240	0.027	0.212	-0.045
student unwanted or competing behaviour	330/305/6/7/8/340/350/360	6.975	1.000	-0.023
student repetitive movements	308	0.134	0.182	0.361

With the data differentiated into those teachers with expressed management difficulty (N=17) and others (N=53) the only significant relationships apparent between teacher proximity to the target student and teacher behaviour were the

moderate negative relationship between student repetitive movements and teacher proximity (r=-0.304, p<0.05), this again indicating the occurrence of this behaviour distant from the teacher, and target student task talk with other students (r=-0.346, p<0.05) for the sample N=53. The latter relationship indicating teacher proximity having a suppressant effect on student-student task talk in the teachers' presence (Table 6.5.9 and 6.5.10).

Table 6.5.10 The Mean Rates (Seconds per Minute) of Teacher Proximity and Student Unwanted Behaviour with a one Interval Lag on Proximity.

Teacher Proximity And Student Unwanted Behaviour	Correlation.	
One Interval Lag On Proximity.	Real Time Data:	One Interval Lag:
Primary school	-0.362	-0.311
Intermediate school	0.277	0.317
Seconary school	-0.026	0.013
N=17	-0.023	-0.025
N=53	0.073	0.262
All Data Combined	-0.104	0.051

Juxtaposing or cross correlating the data to reflect proximity as a subsequent event for student unwanted behaviour resulted in no relationships being found (Figure 6.5.10).

Summary and Discussion

The lack of obtained positive relationships between teacher proximity to the target student and praise for work or behaviour, reprimands, task talk, behaviour talk and social talk, in the current study, indicates that this is not characteristically employed as a means of enhancing teacher classroom management or student application to task by association with a specific teacher verbal behaviour.

The obtained small to moderate relationships between teacher task talk to the target student and teacher proximity across 6 year levels does indicate characteristic behaviour (Section 5.1), although this is only replicated in further analyses in the data for Secondary Schools (Section 5.2).

This result is quite surprising, as even intuitively, in respect to assaying an individual's work, immediacy of feedback and providing further individual direction, it would be expected that such a relationship would enhance management

and application to task. Research indicates that both praise (Shores et al., 1993) and reprimand were more effective when delivered in close proximity than when delivered at a greater distance (Pfiffner, O'Leary, Rosen 7 Sanderson, 1985; Van Houten, Nau, Mackenzie-Keating, Sameoto & Colavecchia, 1982). The latter authors stated that teachers' proximity was effective given the delivery of consequences within this perimeter.

However, as stated above, it may be that frequent non-contingent proximity is a sufficiently effective management strategy such that it circumvents a need for a contingent association. Gunter, Shores, Jack, Rasmussen and Flowers (1995) reported that effective proximity was within 3 feet of the student. Within six feet of a seated student however should proffer a significant discriminative stimulus in defining the occurrence or non-occurrence of behaviour.

The current study recorded all incidents up to 6 feet, this may have resulted in the lack of positive association between teacher task talk, social talk, behaviour talk, reprimand and praise, with a target student or unwanted or competing behaviour. This explanation is probably less credible given the above significant negative correlations found between teacher behaviour talk to the target student and repetitive movements, both occurring the more distal the teacher from the target student. When all data is combined, teacher proximity occurred 8.08 seconds per minute and in all intervals (Table 6.5.1), which is a considerable period 'within striking distance' albeit 'independent' of an individual's behaviour.

This view is consistent with that expressed by Jordan Catapano in K-12 News, who sees proximity and movement as enhancing demand characteristics for application to task, increasing academic engagement and reducing challenging behaviour … "avoid using words … if your class is already talking about something else, then stopping the conversation to address one specific student's behavior may be more counteractive than beneficial. Let your presence do the talking, and add words only if it becomes entirely necessary to do so." (p.2).

7 Overall Summary and Discussion

For all data combined, the predominant teacher verbal behaviours directed toward the target student are, in descending order (seconds per minute): teacher task talk, teacher behaviour talk, teacher reprimand, teacher praise for work, teacher social talk, and teacher praise for behaviour. Student unwanted behaviour is of greater rate than any teacher behaviour directed toward the target student. For all teacher verbal behaviour (to the whole class, to the target student and to other students) combined, the predominant teacher behaviour is task talk, reprimand and behaviour talk are approximate to one another, praise for work and then praise for behaviour (Table 6.6.1). The predominant student behaviour is on-task behaviour (45.579 seconds per minute for all data combined, N=72). The predominant unwanted behaviour is student social talk to other students (2.972 seconds per minute) and unwanted behaviour combined (includes student social talk, 3.386 seconds per minute, N=72, Table 6.6.3).

Table 7.1.1 The Mean Rate (Seconds per Minute) of Teacher Proximity and Verbal Behaviour Directed Toward the Target Student across Samples

Teacher Proximity And Verbal Behaviour Directed To The Target Student (Seconds Per Minute).		**Primary**	**Intermediate**	**Secondary**	**N=17**	**N=53**	**All Data Combined**
teacher proximity to target student	201	18.215	9.509	4.536	6.591	8.181	8.077
teacher task talk to target student	220	0.75	1.064	1.214	1.216	1.034	1.048
teacher praise to target student for work	250	0.026	0.063	0.045	0.066	0.057	0.05
teacher praise to target student for behaviour	260	0.009	0.014	0.019	0.03	0.009	0.014
teacher reprimand of target student	270	0.044	0.073	0.063	0.178	0.028	0.063
teacher behaviour talk to target student	230	0.013	0.116	0.05	0.217	0.03	0.074
teacher social talk to target student	240	0.013	0.116	0.697	0.027	0.033	0.025

Table 7.1.2 The Mean Rate (Seconds per Minute) of Teacher Verbal Behaviour Combined across Samples

Teacher Verbal Behaviour Combined (Seconds Per Minute).		**Primary**	**Intermediate**	**Secondary**	**N=17**	**N=53**	**All Data Combined**
teacher task talk combined	202/220/221	24.912	27.471	30.519	22.283	30.392	27.63
teacher praise for work combined	205/250/251	0.82	1.025	0.652	0.737	0.885	0.817
teacher praise for behaviour combined	206/260/261	0.513	0.343	0.271	0.351	0.309	0.311
teacher reprimands combined	207/270/271	0.711	0.871	1.441	2.658	0.559	1.038
teacher behaviour talk combined	203/230/231	1.32	1.607	1.361	2.339	1.181	1.421
teacher social talk combined	204/240/241	0.64	1.422	1.441	0.821	1.187	1.046

Table 7.1.3 The Mean Rates (Seconds per Minute) of Student On-Task Behaviour, Unwanted Behaviour and Social Talk to Other Students across Samples

Student On-Task Behaviour, Unwanted Behaviour and Social Talk to Other Students (Seconds per Minute)							
Behaviour:	**Code:**	**Primary**	**Intermediate**	**Secondary**	**N=17**	**N=53**	**All Data Combined**
student on task behaviour	301/302/320	51.728	47.284	46.662	36.241	45.579	45.579
student unwanted behaviour	330/305/6/7/8/340/350/360	1.443	3.309	4.300	6.975	2.363	3.386
social talk to other students	330	1.346	2.758	3.901	6.023	2.106	2.973

The predominant student behaviour was on-task behaviour, the predominant student unwanted behaviour was social talk to other students. The negative relationship between teacher task talk to the whole class and student social talk to other students ($r=-0.597$, $p<0.001$) indicates it to be the target student's default behaviour given a decrease in teacher task talk.

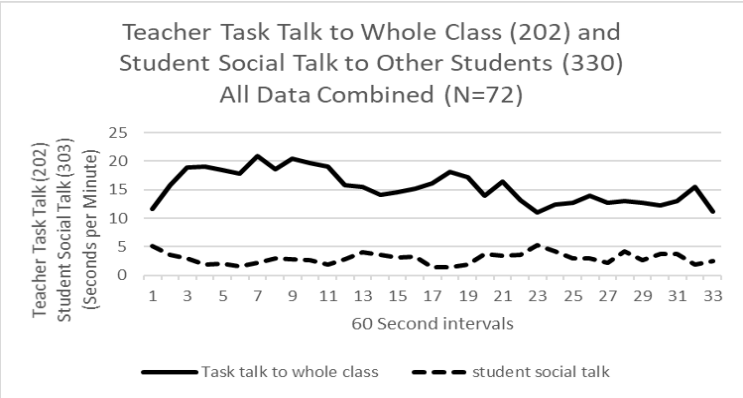


Figure 7.1.1 Mean Rates of Teacher Task Talk to the Whole Class and Student- Student Social Talk

Natural rates of teacher task talk to the target student and other students were greater for Primary School students than Intermediate or Secondary students (Table 6.6.1). Primary teachers used a greater number of reprimands relative to behaviour talk than Intermediate or Secondary teachers. Intermediate teachers used behaviour talk more than reprimand alone. Teacher proximity to the target student, that is, within a two metre radius of the target student, reduced by half (seconds per minute) across each school type from a high of 18.215 seconds per minute for Primary School (Table 6.6.2).

Teacher behaviour directed toward the target student did not relate significantly to student on-task or unwanted or competing behaviour in the expected direction for any of the combinations of data analysed. Frequently, relationships

with student on-task behaviour were of negative valence (teacher praise, reprimand, and task talk).

Teacher interactions with the target student are minimal, the range for teacher behaviour toward the target student (250/260/270/220/230) being 0.008 to 0.75 seconds per minute for Primary School data, 0.01 to 1.06 seconds per minute for Intermediate data, and 0.02 to 1.21 per minute for Secondary School data.

The mean of teacher praise for work across year levels to the target student (250) is 0.041 seconds per minute, combined with a dispersion over 0.158 intervals, when mean student on-task behaviour was 47.07 seconds per minute. Even if all occurrences were contingent, this does not approximate the parameters described by Hester and associates (2009) for the effective use of praise. Teacher praise for behaviour (260) to the target student, mean 0.022 seconds per minute, dispersion 0.074 intervals, is of lesser occurrence. Similarly, the mean of teacher reprimands to the target student (270) 0.066 seconds per minute combined with dispersion over 0.224 intervals, when mean student unwanted or competing behaviour is 2.196 seconds per minute dispersed over 0.628 intervals, does not seem sufficiently approximate to research-established principles for effective punishment, to contain or limit that behaviour (Lerman and Vorndran, 2002; Spradlin, 2002). This was confirmed by the lack of relationships determined subsequently between teacher praise and reprimand and student on-task and unwanted behaviour, for teacher praise and reprimand, directed towards the target student.

Teacher verbal behaviour directed toward the target student in the larger samples (N=53 and all data combined), such as praise for work, teacher task talk and teacher–student reciprocal task talk, correlated negatively with student on-task behaviour – this indicates teacher verbal behaviour directed toward the target student has a deleterious effect on student on-task behaviour. This is further illustrated by the results from Section 5.5, One Student and Two Teachers, in which one teacher pursued a whole of class strategy, the other an individual focus.

Teacher praise to the target student (an individual student) for work is an extremely infrequent occurrence that relates to the predominant student behaviour, on-task behaviour. It is unrealistic to expect a significant relationship between

teacher praise and student on-task behaviour especially in situations with high rates of teacher task talk and student on-task behaviour (N=53).

Teacher reprimand (and behaviour talk) is of greater rate than teacher praise and relates to a, relatively speaking, considerably lesser rate of unwanted behaviour than is found with teacher praise and student on-task behaviour. This greater intrusiveness of unwanted or competing behaviour on classroom function enables greater and immediate discriminability by the teacher and hence immediacy, congruity, consistency and contingency between the unwanted behaviour and teacher reprimand and behaviour talk, consequently it is potentially an effective (Lerman and Vorndran, 2002) and important management tool. Contingent relationships between teacher reprimand and behaviour talk were not apparent in relation to teacher verbal behaviour directed toward the individual student but to the whole class and all teacher reprimand and behaviour talk combined (to all targets summed), and largely given high rates of teacher task talk (N=53).

Results indicated that the principal defining parameters of student on-task and student unwanted or competing behaviour are teacher task talk to the whole class and combined (to all targets summed), that is, to the whole class, to the target student and to other students. Teacher reprimand and behaviour talk combined was shown to relate significantly to student on-task behaviour and student unwanted or competing behaviour given a rate of teacher task talk more than 50% of available time. Teacher reprimand alone (directed toward a target student) or combined (directed toward all targets summed) did not relate to student unwanted behaviour

The high rate of teacher proximity (seconds per minute) to the target student (Table 6.6.1) was found to be associated with teacher task talk to the target student (elevated although not significantly correlated aside from Secondary School data when analysed separately). The moderate relationship found between teacher behaviour talk to the target student and teacher proximity to them for all data combined ($r=-0.349$, $p<0.01$) indicates that this teacher behaviour was likely to be of a public nature. This high rate of largely non-contingent proximity is seen as retaining the teacher as focal and maintaining the demand characteristics in the classroom setting (Catapano, J., 2015).

The ratios for teacher praise for work to student on-task behaviour across all school types to the target student are near zero. The ratio of teacher reprimand and behaviour talk for Intermediate and Secondary School are 5.694% and 2.623% respectively. For Primary School the ratio is considerably higher at 44.160%. These results emphasise the lack of consistency and contingency of reprimand directed to the individual student. When the ratio of teacher reprimand and behaviour talk combined (to the whole class, to the target student and to other students summed) to student unwanted behaviour is considered, ratios of teacher reprimand and behaviour talk to student unwanted behaviour are 74.895% and 65.153% are realised for Intermediate and Secondary Schools.

The ratio for Primary Schools is substantially above 100% (1:1) of the target student's unwanted behaviour (219.670%). This ratio, is considerably greater than the target student's rate of unwanted behaviour, and may explain the students' higher rates of on-task behaviour given lesser rates of teacher task talk. This ratio, plus the high rate of teacher proximity to the target student (18.215 seconds per minute), combined with minimal praise for work (ratio of 1.586%) may indicate that on-task behaviour is maintained by negative reinforcement, that "compliance (generally) may have been under the control of negative reinforcement contingencies," (Shores, Jack, Gunter, Ellis, DeBriere and Wehby, 1993, p.27), for this group of students.

These results, that teacher verbal behaviour to the whole class and combined relate significantly to student on-task and unwanted behaviour, indicate that there is substantive commonality between student behaviour within the classroom, they tend to behave in concert with one another. Further, that contextual rather than individually directed teacher verbal behaviour, predominantly defines individual behaviour in the classroom. The Section relating to one student and two teachers emphasises this, although it is evident through all analyses.

Teacher whole class instruction relates significantly to target student on-task behaviour, a more targeted student direction of task talk does not.

When the samples relating to teachers having management difficulty (N=17) and those not (N=53) are compared, of note is the greater variability and

duration (seconds per minute) of teacher praise (albeit equivalent rate, incidents per minute, between samples), teacher reprimands and behaviour talk and student unwanted or competing behaviour. This indicates that at a certain rate (seconds per minute) of teacher task talk other relations between teacher behaviour and student performance become lost. Students begin defining what they will or will not do (e.g. perseverative student – teacher social talk in N=17). In this case teacher task talk (202/220/221) is 22.28 seconds per minute for sample N=17 and 30.39 seconds per minute for N=53. Teacher task talk in sample N=53 is 50.65% of available time, for N=17 it is 37.13% of available time. This differential in teacher task talk is also related to differences between student unwanted behaviour. For N=53, unwanted behaviour was constituted of 89.14% social talk to other students, for N=17 this was 86.35%, this indicating greater rates of more extreme behaviour associated with the lower rate of teacher task talk. The increase in student unwanted behaviour in N=53 after interval 22 indicates the student default position to be social talk to other students. The continued reduction in teacher reprimand and behaviour talk and increase in student social talk after interval 22 indicates acceptance of this previously unwanted behaviour given the maintenance of a high rate of student on-task behaviour after this point.

For sample N=53 with greater overall rates of teacher task talk, and reprimand and behaviour talk over the first 22 intervals ($r=0.797$, $p<0.001$) to all targets, a 1:1 ratio, the data reflects the immediacy of the consequences, consistency, contingency, ensures they are time-limited, suppresses reinforcement for the unwanted behaviour and ensures the availability of an alternative reinforced response, student on-task behaviour. That is, the data is consistent with research-established principles for effective punishment (Lerman & Vorndran, 2002; Spradlin, 2002). Teacher praise, under similar conditions of high rates of teacher task talk and student on-task behaviour, does not conform to these principles (Hester et al., 2009), is intrusive and detracts from student on-task behaviour. The natural rates of teacher verbal behaviour and the rates of interaction or behaviour that is accessible to an individual student (public) and is consistent or congruent with desired functioning define and maintain the demand characteristics and appropriate student functioning. This includes the retention of teacher as focal and

maintaining instructional control. Individual contingencies, response-consequence relations or individual contingencies are secondary to these.

Social consequences, praise and reprimand, are meaningful descriptors only when viewed in relation to the rate and duration of the referent behaviour, the behaviour to which it relates (rates of on-task behaviour and unwanted behaviour). For example, praise for academic or on-task behaviour is viewed relative to the predominant student activity within class, student on-task behaviour (Ndoro et al., 2006). This indicates the maximum potential consistency and contingency of the behaviour-subsequent event relation and hence potential effectiveness - both praise and reprimand will produce a greater reduction in response rate if delivered on a continuous schedule; (Lerman & Vorndran, 2002; Hester et al., 2009).

The obtained results emphasise the importance of the wider social context (rates of teacher task talk) including the 'temporal' or sequential context in assessing behaviour-subsequent event relations in the classroom. Contiguous relationships alone do not accurately describe these relationships (e.g. reprimand and behaviour talk).

Generalising from functional analysis results, indicating specific behaviour (e.g. praise) to be reinforcing seems inappropriate, more risky or tenuous than does generalising from research-based principles across settings as is inherent in assaying the specific behaviour (subsequent event) in reference to the background behaviour to which it applies. In this case praise in reference to student on-task behaviour and reprimand and behaviour talk to student unwanted behaviour.

The purpose of the present study was to use descriptive analysis to look at the relationship of rates of teacher task talk and the effectiveness of social consequences (positive and negative) in maintaining appropriate task and social performance on this base in respect to a target student in classroom settings. This as opposed to an individual teacher–student focus. This was reflected in the adopted Hypotheses.

Samples N=72, N=53, and Intermediate and Secondary Schools are referenced as these samples represent normal classroom functioning, the Primary

School data with high rates of reprimand, student focus and proximity of the teacher to the students, and sample N=17 (teachers describing management difficulty) with low rates of teacher task talk and variability across all teacher and student behaviour do not.

Hypothesis H1 A high rate of teacher task talk would be associated with a high rate of student on-task behaviour. High rates of teacher task talk are both discriminative stimuli for students gaining and maintaining task orientation, and are prescriptive or defining of the contingency operating for student attention and behaviour. *This would be evident in a significant positive correlation between the independent variables, the rate of teacher task talk to the whole class (202) and combined (202/220/221) and the dependent variable, student on-task behaviour (301/302/320).*

Medium relationships and effect sizes were found for all teacher task talk (202/220/221) and student on-task behaviour (301/302/320). Coefficients ranged from r=0.382 to 0.454 ($p<0.01$ to 0.001).

Medium to very large relationships were found between teacher task talk to the whole class (202) and student on-task behaviour (301/302/320). Coefficients ranged r=0.484 to 0.704 ($p<0.01$ to 0.001). Teacher task talk to the whole class (202) represents that teacher task talk that is public in nature.

Student working and attending to the teacher (301) is more representative of student on-task behaviour as characteristically throughout analyses teacher verbal behaviour directed toward the target student (302) and other students (320) related negatively with, or not at all to, student on-task behaviour. These results, range from r=0.515 to 0.719 ($p<0.01$ to 0.001). The very large relationship found between teacher task talk to the whole class (202) and student on-task behaviour (301, r=0.719, P 0.001) particularly for sample N=72 (all data combined), plus relationships found with the other samples provide strong support for Hypotheses H1.

Hypothesis H2 A high rate of teacher task talk would be associated with reduced rates of student unwanted or competing behaviour. Competing or

unwanted behaviour, such as talking with peers, would be expected to be more manifest in the 'void' created by less teacher task talk. This would be evident in a significant negative correlation between the independent variable, teacher task talk to the whole class (202) and combined (202/220/221), and the dependent variable, student unwanted or competing behaviour.

For samples N=72, N=53, and Intermediate and Secondary Schools relationships between teacher task talk combined (202/220/221) and student unwanted behaviour ranged from a high r=-0.192 to -0.556, $p< 0.1$ to $p< 0.001$.

Moderate to large relationships and effects sizes were found between teacher task talk to the whole class (202) and student unwanted behaviour, coefficients ranged from a low of r=-0.545 to -0.674, $p< 0.01$ to 0.001. These results, particularly the relationships found between teacher task talk to the whole class and student unwanted behaviour for all data combined (N=72, r=-0.572, $p<0.001$), indicate that Hypotheses H2 is supported.

Hypothesis H3 A high rate of teacher task talk is the defining condition under which reprimands and behaviour talk reduce student unwanted or competing behaviour and maintain a high rate of student on-task behaviour. This would be evident in fewer reprimands and behaviour talk, in reprimands and behaviour talk being of shorter duration, greater association of reprimand and behaviour talk with unwanted behaviour, and subsequently, a significant negative relationship between teacher reprimands and behaviour talk and student unwanted behaviour, and a significant positive relationship with student on-task behaviour, for those teachers evidencing high rates of teacher task talk. This indicating a conditional functional relationship.

Reprimand and behaviour talk are analysed severally and combined. Analysis of different year levels (Section 5.1) showed a transition from predominantly teacher reprimand and student focus, to reprimand and behaviour talk and a whole class focus in year 7 and 8 (Intermediate classes). Teacher reprimand although of high rate did not relate contiguously with student unwanted behaviour (N=72, r=0.064). A one interval lag on the independent variable to better represent the behaviour-subsequent event relationship realised a medium

relationship and effect size (r=0.467, p<0.001) for all data combined (N=72). Behaviour talk, or talk about conduct, is often an adjunct to, or is used as an alternative to reprimand. Analysis of teacher reprimand and behaviour talk combined to the whole class and all targets combined contiguous with student unwanted behaviour (lag=0) for N=72 were minimally significant (r=0.248, p<0.05). Cross-correlation (lag =1) realised a large relationship and effect size (r=0.622, p<0.001), this representing high correspondence between the independent and dependent variables. A further one interval lag of the independent variable found a medium relationship (r=0.372, p<0.01) between teacher reprimand and behaviour talk and insignificant relationship with student on-task behaviour. These results reflect the protracted nature of the reprimand process, no suppression effect on unwanted behaviour nor positive effect on student on-task behaviour. For N=17, contiguous relationships between teacher reprimand and behaviour talk with unwanted behaviour were r=0.027 with unwanted behaviour and r=0.107 for on-task behaviour. For N=53, these were r=0.078 and 0.157 respectively. Cross correlation (lag 1) realised relationships for N=17 of r=0.360 with unwanted behaviour and r=-0.056 with on-task behaviour. For N=53 the relationship with unwanted behaviour was r=0.402 (P 0.01), with on-task behaviour r=-0.089. Lagging the independent variable a further interval (lag=2), for N=17 reprimand and behaviour talk related moderately with student unwanted behaviour (r=0.567, p<0.01) and r=-0.370 with on-task behaviour. For N=53, respective relationships were r=-0.353 (p<0.02) with unwanted behaviour and r=0.481 (p< 0.02) for student on-task behaviour. These results indicate a more protracted reprimand process for sample N=17 with a minimal suppression effect on unwanted behaviour. For N=53, obtained relationships indicate a moderately effective suppression effect on unwanted behaviour and positive effect on on-task behaviour. A further lag resulted in similar results for both N=17 and N=53. When the data for N=53 was truncated to reflect the period of greater teacher task talk and reprimand and behaviour talk (22 intervals) reprimand and behaviour talk related r=0.797 (p<0.001) with unwanted behaviour with a one interval lag on teacher reprimand and behaviour talk, this representing a very large relationship and effect size and association between the two variables, this approximates research-established principles for effective punishment (Spradlin, 2002). For N=53, with a rate of teacher task talk greater than 50% of available time the results indicate a high correspondence

between teacher reprimand and behaviour talk and student unwanted behaviour and that teacher reprimand and behaviour talk had a medium suppressing effect on student unwanted behaviour, and positive (medium to large) effect on student on-task behaviour within a two-interval time frame. This was not the case with teachers with lesser rates of task talk (Section 5.4, Table 5.4.24). These results provide support for this hypothesis.

That all teacher reprimands and behaviour talk toward all targets combined related more than teacher reprimands and behaviour talk targeted toward an individual student is consistent with the view that teacher verbal behaviour directed class-wide is of greater effect in the management of the behaviour of an individual student than teacher behaviour directed to the target student alone.

Hypothesis H4 A high rate of teacher task talk would be associated with a high rate of student on-task behaviour and with praise being significantly related to both variables. This would be evident in a significant positive correlation between teacher praise and student on-task behaviour given a high rate of teacher task talk. That is a conditional functional relationship.

Relationships between teacher praise and student on-task behaviour, analysed severally (praise for work alone) or combined (praise for work and behaviour), overall were insignificant or were of negative valence. For sample N=53, teacher praise to the target student for work related moderately ($r=-0.418$, $p<0.01$) with student on-task behaviour. These results (N=53) indicate praise to be intrusive given high rates of teacher task talk and corresponding high rates of student on-task behaviour. A large negative relationship was found for all data combined (N=72, $r=-0.509$, $p<0.001$). The results from Section 5.2, Intermediate extended data, indicate a strong relationship between teacher praise and student on-task behaviour is associated with low and decreasing rates of teacher task talk - although this relationship is secondary to that of teacher task talk and may be conditional on high rates of teacher task talk preceding this (34 intervals). This latter point is emphasised by the lack of relationship between the low rates of teacher task talk and student on-task behaviour for those teachers with self-reported

management difficulty (Section 5.4). The results from the extended Intermediate School data indicate that praise relates to student on-task behaviour conditional on low rates of teacher task talk. No relationships were found between all teacher praise (to all targets combined, 205/250/251/206/260/261) and student on-task behaviour (301/302/320), either contiguously (r=0.061) or with a one interval lag on all teacher praise (r=-0.007) for sample N=72.

Hypothesis H4 is not supported by the data.

Hypothesis $H_{overarching}$ The overarching hypothesis is that increasing the rate of teacher task talk that is public (accessible to the target student) improves student functioning within the classroom. This more so than would a teacher-student focus alone.

Teacher task talk that is public in nature is represented by code 202. The very large relationship found between teacher task talk to the whole class (202) and student on-task behaviour (301, r=0.719, p<0.001) for sample N=72 (all data combined), plus relationships found with the other samples provide strong support for this hypothesis..

The relationships found between teacher task talk to the whole class (202) and student unwanted behaviour for all data combined (N=72, r=-0.572, p<0.001), indicate that Hypothesis $H_{overarching}$ is supported.

Section 5.6, Increasing Teacher Task talk, a Case Study, showed that increasing teacher task talk has the concomitant effect of increasing student on-task behaviour and reducing student unwanted or competing behaviour. The increase in all teacher task talk in this data is associated with an increasingly negative relationship between teacher task talk to the target student and student on-task behaviour.

The above data is consistent with and provides support for the hypotheses (Hypothesis $H_{overarching}$, H1, and H2), that increasing teacher task talk has the concomitant effect of increasing student on-task behaviour and reducing student unwanted or competing behaviour, that it improves student functioning within the classroom.

The data from the current study both describes and supports current teacher practice in respect to the minimal use of praise and continued use of reprimand and behaviour talk, given high rates of teacher task talk, to the whole class in particular, and all targets combined – because this approach is associated with maintaining high rates of student on-task behaviour and low rates of unwanted or competing behaviour. High rates of teacher task talk are associated with reprimand and behaviour talk effectiveness. The obtained natural rates of praise indicate the juxtaposition of praise and reprimand or praise/reprimand ratios to be of minimal or even negative utility.

The maintenance of student attention and on-task behaviour are fundamental to the acquisition of an education as is the ability of the teacher to maintain themselves as focal in this process.

These results do not detract from the notion of 'enjoyment' of classroom activity, which cannot be seen as differentiable from teacher enthusiasm, which can be subject or topic imbued in the absence of praise, as the current data would imply.

The case study increasing teacher task talk (Section 5.6) shows the immediate positive impact of increasing teacher task talk, to the whole class and teacher task talk to all targets combined, on both student on-task behaviour and unwanted behaviour, thus further reinforcing the tenets described. The increase in all teacher task talk in this data is associated with an increasingly negative relationship (correlation) between teacher task talk to the target student and student on-task behaviour and positive significant relationship with teacher task talk to the whole class and to all targets combined. This is consistent with the finding across all data sets that at a certain rate (seconds per minute) teacher task talk loses the relationship with student on-task behaviour (N=17) and other factors become prescriptive or defining. Notably there is greater unwanted or competing behaviour and lesser on-task behaviour indicating greater student definition of behaviour.

If teacher (adult) talk is task or activity specific and this focus is frequent, ongoing (occurs at a high rate), and public, this defines the situation, behavioural expectation and performance. It defines the context of the learning environment … 'if you focus on what you want, you are more likely to get it.' This latter statement

is also supported by the results for teacher focus on non-academic task, teacher social talk.

In the writer's experience consistency in application of contingencies has needed to be greater than 50% of occurrence of the target or referent behaviour to effect and maintain behaviour change. The results from the current study are consistent with this view. Research needs to evaluate more exactly the rates of teacher task talk necessary to maintain student on-task behaviour and minimise unwanted behaviour.

Teacher reprimand was separated from behaviour talk as the latter often reflects the protracted correlates of, or alternative to, reprimand. This differentiation was discriminating of differences between the predominant use of reprimand in Primary School data and behaviour talk being predominant in Intermediate and Secondary Schools, and in emphasising differences between those teachers who had expressed difficulty in classroom management (N=17) and those who had not (N=53).

In the current study teacher task talk greater than 50% of available time is associated with considerably greater rates of student on-task behaviour and lesser rates of unwanted behaviour and considerably less variability in student and teacher behaviour. Inclusion of the additional intervals for the Intermediate School data (94 intervals) realised strong relationships between teacher task talk combined and student on-task behaviour ($r=0.967$, $p< 0.001$) and this with reducing rates of both. High rates of teacher task talk were maintained for approximately 34 minutes, this may reflect the maximum time teachers are able to maintain such a rate. These results may suggest that high initial rates of teacher task talk are prerequisite to establishing the large relationship between teacher task talk and praise and student on-task behaviour given subsequent lower rates (seconds per minute) after 34 intervals - and that this relationship is maintained by a reduction in the related background or referent behaviour (student on-task behaviour). The larger relationship between teacher task talk and student on-task behaviour than teacher praise and on-task behaviour, and the relationship between teacher praise and teacher task talk ($r=0.64$) indicate the two are strongly associated, with teacher task talk having the considerably greater relationship with student on-task behaviour.

Maintenance of a high association between reprimand and behaviour talk and student unwanted behaviour, a 1:1 ratio for 22 minutes of class time in conjunction with a rate of teacher task talk to the whole class and all targets combined, greater than 50% of available time throughout (Section 5.4), was sufficient to maintain student on-task behaviour at a high rate despite student social talk to other students increasing (to 'acceptable or manageable' rates) after interval 22, as is attested to by minimal further reprimand and behaviour talk after that time (a ratio of 0.45:1).

When considering teacher task talk to the whole class alone (202) and student on-task behaviour alone (301) and student unwanted behaviour large positive relationships were found between teacher task talk to the whole class and student on-task behaviour and large negative relationships with student unwanted behaviour for Intermediate and Secondary School samples. That similar results were not found for Primary School data probably reflects the lesser rate of teacher task talk to the whole class, the 'reprimand-rich' nature of those classes, and possibly reflects a greater component of attending to teacher these behaviours elicit, which is included by definition in the on-task measure.

Overall, the results show that high rates of teacher task talk that are public in nature (accessible to the target student) constantly define expected behaviour and constitute a more generalised, proactive and practicable intervention than selective attention or 'planned ignoring', or adopting an individual student focus regarding task talk, praise, reprimand and behaviour talk, or endeavouring to improve teacher–student relationships through non-academic endeavour. Increasing the rate of teacher task talk that is public (accessible to the target student) improves student functioning within the classroom (Hypothesis $H_{overarching}$).

Teacher task talk is functionally related to student on-task and unwanted behaviour.

7.2 The Current Study

As was stated in the Rationale for the Current Study (p.27), the lack of prior research relating to the dimensions examined in the current study has necessitated

the inclusion and analysis of a large number of variables. This has enabled the classroom social context to be comprehensively measured and relationships between independent and dependent variables clarified in a meaningful manner. The consequence of this has been the overall length of the study.

7.3 Limitations of the Current study

Data were real time continual recordings combined within 60 second intervals. All correlations were seconds per minute of actual recorded behaviour. Differences between dispersion (incidents per minute) and rate (seconds per minute) are substantial and paint a topographically different picture. It is probable the use of this continual data has resulted in differences between the results from the current study and other published data. Continuous recording has obvious advantages over time sampling procedures in that it includes all behaviour, it enables a focus on time spent in an activity and correlations, on extended patterns of behaviour rather than response rate (Baum, 2003, the molar analysis of behaviour). This allows for lagging the independent variable relative to dependent variables to better reflect the subsequent (and/or protracted) nature of the independent variable, such as praise and reprimand, and the changing relationships over time. Antecedents are seldom discrete or momentary e.g. teacher going 'invisible', period of teacher inactivity. Consequences are seldom immediate (task specific praise, reprimand and behaviour talk), momentary, consistent, contiguous or effective.

Results from the different school sectors (Primary, Intermediate and Secondary), indicate that each have characteristics particular to that sector.

Greater differentiation of teacher–student behaviour would have provided more discriminable results. For example, non-academic teacher behaviour (teacher social talk) could have had student attention to teacher identified as non-academic attention to teacher which would probably have resulted in correlations of negative valence rather than those obtained. The correlation for teacher social talk for all data combined was $r=0.255$, $p<0.05$ with student on-task behaviour (301/302/320). Correlation with teacher reprimand and behaviour talk $r=0.436$, $p<0.001$. The initial

correlation reflects student attending, not the ongoing effect of this. For example, in sample N=17 teacher social talk is associated with student perseverative attempts to continue the interchange once this is initiated. This is apparent with respect to reprimands and behaviour talk in Section 5.5 with teachers expressing management difficulty (N=17) and those not (N=53). A two-interval lag realized maximal correlation (congruity between the behaviour) with student unwanted behaviour for the former, a one interval lag for the latter. This indicates the protracted nature of reprimand and behaviour talk for the sample N=17 relative to N=53.

The data (summation within 60 second intervals) did allow for analysis of the temporal association between behaviour (cross correlations or lags) although not contingent relationships specifically within a real time (second by second) data flow. Correlations and lags can be seen as approximations to this, although difficulties in this area are likely to be present irrespective of interval size. A 60 second interval size can be seen as often incorporating consequences or behaviour that might otherwise not be realised as associated. For example, teacher praise, where a smaller interval may well show a positive significant correlation due to only recording immediate student attention to the teacher.

Defining an 'appropriate' interval size that adequately encompasses a range of behaviour of high and low occurrence (rate) is probably an unattainable goal.

Refining behaviour codes and recording to more discriminate behaviour, given current analysis may be impracticable in that it may necessitate many 'passes' over the data or automatic recording.

Given the above reservations, a 60 second interval was optimal for analysing most teacher verbal behaviour in the current study particularly reprimand and behaviour talk.

7.4 Implications for Research and Practice

The implications for teaching practice and special education involvement in classrooms are considerable, and are counter to much of what has been proposed or

posited by previous research – results indicated that the principal defining parameter of student on-task and student unwanted behaviour was teacher task talk directed to the whole class and combined, that is, to the whole class alone, to the whole class, to the target student and to other students summed; a singular individually targeted programme within a classroom context is of questionable utility – teacher verbal behaviour directed to the target student related negatively with student on-task behaviour; praise as a reinforcer for on-task behaviour is of questionable utility – praise related insignificantly or negatively with student on-task behaviour. In view of these results, smaller class sizes are seen as maximising potential difficulties rather than ameliorating them; teacher social talk is related to negative teacher response, and under conditions of low rates of teacher task talk indicative of additional management difficulty; reprimand and behaviour talk are effective classroom management strategy given correspondingly high rates of teacher task talk.

Teacher effects have repeatedly been shown to be salient in relation to student performance and to transcend socio-economic factors (Rowe & Rowe, 2002). The current study helps define the parameters important in optimising these.

Content knowledge and planning are imperatives, as is the ability to talk to the immediate topic in an ongoing manner in realizing this. The classroom is a 'noisy' environment. The more you talk, there is less room for competing imposition; task talk defines expected behaviour in an ongoing manner, it retains interest in the topic, it makes it easier to comment on an individual's work publicly (as a prompt for others) to extend on this, retains the focus with the teacher and embeds reprimand and behaviour talk within a predominant work-based context – the latter consequently conforming to known research-based punishment principles.

The analysis of natural rates of teacher verbal behaviour in the current study provides substantial support for current teaching practice: for a whole class focus rather than an individual student focus and a task talk focus rather than 'relationship' (social talk) focus; and for the cautious use of praise – it was found to have a deleterious effect on student on-task behaviour in the classroom over the period of maximal teacher instruction (34 intervals) and student on-task behaviour. High rates of teacher task talk are associated with reprimand and behaviour talk

effectiveness. Improvements upon this base to attain increases in student on-task behaviour and reductions in unwanted behaviour are minimal, as was demonstrated in the case study increasing teacher task talk, and the means is often within teachers' existing repertoires. An individual student focus is deleterious to student learning and exacerbating of student unwanted behaviour.

The current study emphasises the importance of the rate of referent behaviour (student on-task and unwanted behaviour) and greater social context (rates of teacher task talk) in assessing the effectiveness of other consequential events (praise and reprimand), and the importance of teacher verbal behaviour in relation to 'temporal' or sequential context. Continual data recording enables a focus on time spent in an activity and correlations, on extended patterns of behaviour rather than response rate (Baum, 2003). Data can be juxtaposed (cross correlated) to reflect the consequential nature of praise and reprimand (the strength and valence of relationships over time). Graphical representation of data proffers considerable additional information. Contiguous relationships alone do not accurately describe these relationships (e.g. reprimand and behaviour talk). The rate of teacher task talk is fundamental to and functionally related to student on-task behaviour and student unwanted behaviour in the classroom. The overall context is salient in defining common and hence individual behaviour, individual contingencies being secondary to this.

Neither teacher nor student behaviour is characteristic within or across classes, this particularly so in those classes in which teachers are experiencing some difficulty and as is also illustrated by the differences found within Intermediate School data (Section 5.2). Teacher task talk in the current study was maximal for the first 34 minutes of class and this was also the case for the more difficult classes.

The use of continuously recorded data and correlations, graphical representation of data alongside the behaviour-subsequent event ratio and cross correlation are necessary to account for a sufficient analysis of temporal and reinforcement relations in natural environments. It is more prudent generalising research-based behavioural principle (e.g. contingency, immediacy, consistency, effect on the behaviour, proximity and specificity, (Hester et al., 2009) than it is to generalise from any particular behaviour found to be effective in functional analysis

studies. "… reinforcers are what reinforcers do, and one can only make this determination after the fact, once an event has followed behavior and the behavior has measurably accelerated." (Critchfield & Miller, 2017). The qualitative nature of the subsequent event itself does not dictate whether or not it is a reinforcer.

The maintenance of attention, application to task and instructional control are a function of the rate of teacher task talk that is public or accessible to the individual student. This defines the context and associated demand characteristics which define student behaviour. High rates of task talk maximise the contrast between punished and non-punished events in that it enables an ongoing positive task-based relationship and increases the effect of punishment (MacMillan et al., 1973). It ensures an unpunished alternate response is available that is reinforced on a schedule equal to or greater than the schedule of reinforcement for the punished response than if no such alternate response is available (Spradlin, 2002). The rate of task talk needs to be pervasive as the student's default position is social talk to other students.

A high rate of teacher task talk that is public enables distractibility, off-task and inappropriate behaviour to be addressed by task or work-related redirection as opposed to addressing problem behaviour directly. Teacher task talk to the whole class is functionally related to student on-task and unwanted behaviour. Increasing the rate of task talk, concomitantly increases student on-task behaviour and suppresses unwanted behaviour (Section 5.6, Hypothesis $H_{overarching}$, H1, and H2). Reprimands mainly result in the immediate suppression of unwanted behaviour, albeit temporarily. To be effective, punishment should be immediate on the behaviour and stop when the behaviour stops (Lerman & Vorndran, 2002). Any ongoing positive effect from such intervention is dependent on the immediacy of redirection to work, directing task related attention to the on-task behaviour of others (reducing the public nature of the intervention), and all within the period in which the unwanted behaviour is attenuated. A high rate of teacher task talk enables the teacher to continue proactively defining the situation as task related for all.

Addressing individual student behaviour or issues in any but a brief (not protracted) manner in the classroom focusses the whole class on that event and suppresses the on-task behaviour of all.

“Teacher talk is not only dominant, but also regulatory … Teachers in the classrooms we studied do most of the talking. Their talk is most often directed at the entire class and less frequently at individual members of the class. … Students' verbal behavior is much more limited than that of teachers. They are basically responders rather than initiators” (Collins & Earl Seidman, 1972, p.2).

The principles described in this paper (research-based principles for effective praise and punishment) are equally relevant to child management practice, personnel management, interpersonal relationships, and conversational skills. Because someone says or does something, you don’t have to respond to it. If you stop or focus on it, this gives it credibility, empowers them and enables them to define your next move (N=17). An ongoing task or topic-based narrative provides a means of limiting this process (whether the issue is addressed or not) thus limiting any affective response in intensity and time (N=53). It is practicable and easier to do than ignoring unwanted behaviour, or addressing behaviour you don’t want to address, and it maintains the predominant task or topic as focal.

Teacher task talk to the whole class retains an overriding task or topic focus with all students. That teacher verbal behaviour to the whole class and combined relate significantly to individual student on-task and unwanted behaviour, indicates there is substantive commonality between student behaviour within the classroom, they tend to behave in concert with one another. This is understandable and consistent with maintaining a common task focus within the classroom setting. An individual student focus detracts from on-task behaviour and necessarily deviates from the generalised (class-wide) pursuit of goals. This is reflected in the results for Primary School wherein a higher rate of teacher task talk to individual students than to the whole class than other school types is characterised by an overarching negative reinforcement paradigm and very high rates of teacher proximity to individual students.

Contextual factors rather than individually directed teacher verbal behaviour, predominantly define individual behaviour in the classroom.

The current results proffer empirical support for the use of behaviour-subsequent event analyses to infer reinforcement effects in continuous descriptive data.

The current study successfully trials a continuous real-time recording system that readily enables fine discriminations between behaviour.

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Appendices

Appendix 1

University of Waikato

Research Information Sheet

The Effects of Reinforcement Context on the Effectiveness of Social Consequences

The purpose of the present study is to use descriptive analysis to look at the relationship of base-rate rates of teacher task-talk related to student on-task behaviour and the effectiveness of social consequences (positive and negative) in maintaining appropriate task and social performance on this base. Further, to assess reprimands on the same base and the relative effectiveness of these in respect to the congruence of them with known punishment principles, in classroom settings. Classroom observation will be by video camera.

Researcher Name & Contact Details:	Supervisor Name & Details:
Morton Osborne	Dr Mary Foster
Psychologist	Professor
Special Education	Psychology Department
Ministry of Education	University of Waikato
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Participants.

Participants will be teachers and students within ‘mainstream’ schools across different year rates (years 1-13) and across schools rated by the Ministry of Education as deriving their students from predominantly low socioeconomic areas (‘low decile’ schools) or high socioeconomic areas (‘high decile’ schools).

The research is focused on observing and describing teacher practice during the course of normal classroom interactions and tasks and how this affects student behaviour.

There will be no necessity to personally identify either teachers, students, classes or schools for the purposes of the study aside from year level and decile rating of the school.

Participation in the study will be voluntary.

Procedure.

The initial approach to schools will be conducted by the researcher. Discussion of the research project and the requisite consents required by the school will be discussed at that time. For example, whether or not they will require consents additional to those that will be attained from the respective teachers, students and parents or caregivers.

Additional to attaining consents will be the provision and discussion of the information sheet regarding the research, providing opportunity to discuss the implications of this or how this is likely to impact on them and the consent for participation. This will be undertaken with the school principal, the class teacher and students.

The nature and time span of the study will be communicated to all students in the school at the school assembly and information similarly presented within the school newsletter to parents.

Procedure.

Participants will only be involved in observations (video recordings). Observations will be conducted during periods of teacher whole class instruction and directed whole class at deskwork. Each observation period will be of three hours duration and involve three observation sessions.

The video equipment will be located at the rear of the class directed so as to record the area of predominant teacher instruction. The camera will remain focussed on the teacher and remain static i.e. there will be no ‘panning’ of the camera.

Three microphones will be used during filming. A wireless lapel microphone will be placed on the teacher, another will be centrally located in the classroom and there will be an accessory microphone on the camera with a 120 degree range.

Storage And Disposal Of Data.

Data will be collected in video form, transferred to DVD, analysed and archived electronically in numerical form for further analysis and for reference purposes. There is a requirement that the obtained data be available for secondary analysis. For this purpose it will be securely stored.

Method For Preserving Confidentiality And Anonymity.

No personal identifying information is required for the study and none will be kept.

Information retained will include: class year or level, decile rating of the school, whether the school is a Primary, Intermediate or High School and the behaviour observation data.

The DVDs collected will be used for research purposes only. Access will be restricted to researchers analysing the tapes and with university supervisors; no one else will be allowed to view the DVDs.

The results of this study will only be recorded as averages across students and classrooms, never as information about a single identifiable person or classroom. Any identifying characteristics of the participants: students; teachers; classes and schools will be kept in locked storage; even persons hired to code and analyse the tapes will not have access to this information and will have completed a confidentiality agreement.

There will be no necessity to personally identify either teachers, students, classes or schools for the purposes of the study aside from year level and decile rating of the school.

As a participant you are able to get further clarification about the study at any time during the study and access any data relating to yourself , any of your students or your child.

Withdrawal of consent can be enacted by contact with the researcher directly, or via the school, Special Education or Waikato University, either verbally or in writing at any time.

Appendix 2

Participant's consent form

University of Waikato

Psychology Department

Consent Form

Participant's Copy

Research Project: **The Effects of Reinforcement Context on the effectiveness of Social Consequences.**

Name of Researcher: Morton Osborne.

Name of Supervisor: Dr Mary Foster.

I have received an information sheet about this project and the researcher has explained the study to me. I have had the chance to ask any questions and discuss my participation with other people. Any questions have been answered to my satisfaction.

I agree to participate in this research project and I understand that I may withdraw at any time. If I have any concerns about this project, I may contact the convenor of the Research and Ethics Committee (Dr Robert Isler, phone 834 4466 ext. 8401, e-mail r.isler@waikato.ac.nz).

Participant's Name: _____ Signature:_____

Date: _____

University of Waikato

Psychology Department

Consent Form

Researcher's Copy

Research Project: **The Effects of Reinforcement Context on the effectiveness of Social Consequences.**

Name of Researcher: Morton Osborne.

Name of Supervisor: Dr Mary Foster.

I have received an information sheet about this project and the researcher has explained the study to me. I have had the chance to ask any questions and discuss my participation with other people. Any questions have been answered to my satisfaction.

I agree to participate in this research project and I understand that I may withdraw at any time. If I have any concerns about this project, I may contact the convenor of the Research and Ethics Committee (Dr Robert Isler, phone 834 4466 ext. 8401, e-mail r.isler@waikato.ac.nz).

Participant's Name: _____
Signature:_____

Date: _____

Parent's Copy

FORM OF CONSENT

I _____ give permission for video records to be taken in the classroom during lessons in which my child (_____) participates and for these videos to be used for research purposes and for teacher training.

I understand that these video records will:

be used for the research purposes stated and for professional development for the teacher – ie. defining teacher instruction to maximise student performance.

The video procedure will involve a video being set up at the rear of the classroom – this will probably be operated by the classroom teacher. This record will later be transcribed by two observers.

I agree / do not agree that these video records may be used for the described research purposes.

I am aware that my child may be able to be identified visually.

No child will be identified by name.

The videos will not be viewed by anyone not involved in the research.

The videos will be securely stored after transcription.

The videos will not be used for any purposes other than those stated.

If I do not wish my child to participate they will be placed in another class for the duration of the study.

I reserve the right to:

Request to view the video footage.

Withdraw the consent at any stage.

Withdrawal of consent will not impact on any other services that may be, or are being provided, by Special Education.

*Signed:*_____*(parent)* *Date:* _____

*Signed:*_____*(child)* *Date:* _____

Appendix 3

All Sessions by Year Level, Class Subject, Teacher Experience and Gender

Table A3.1 Sessions by Year Level, Class Subject, Teacher Experience and Gender with Session And School Identification Numbers

Session ID	Class Subject	Year Level	Years Teaching	School Code	Gender of Teacher	Gender of Student
5096	General	2	12	404	Male	Male
5249	General	3 and 4	11	404	Female	Male
5253	General	3 and 4	11	404	Female	Female
5233	General	4 and 5	7	404	Female	Female
5237	General	4 and 5	7	404	Female	Male
5274	General	5 and 6	15	404	Female	Female
5278	General	5 and 6	15	404	Female	Male
5282	General	7 and 8	12	404	Male	Female
5286	General	7 and 8	12	404	Male	Female
5290	General	7 and 8	12	404	Male	Male
5294	General	7 and 8	21	404	Female	Male
5298	General	7 and 8	21	404	Female	Male
5476	General	7 and 8	21	405	Female	Male
5070	General	7 and 8	21	405	Female	Male
5380	General	7 and 8	21	405	Female	Male
5411	General	7 and 8	28	405	Male	Male
5416	General	7 and 8	28	405	Male	Male
5072	General	7 and 8	28	405	Male	Male
5007	Art	7 and 8	12	401	Male	Male
5327	Art	7 and 8	12	401	Male	Male
5351	Art	7 and 8	12	401	Male	Male
5370	Art	7 and 8	12	401	Male	Male
5098	General	7 and 8	9	401	Female	Female
5100	General	7 and 8	15	401	Female	Female
5199	General	7 and 8	4	401	Male	Female
5201	General	7 and 8	4	401	Male	Female
5210	Art	7 and 8	12	401	Male	Male
5212	Art	7 and 8	12	401	Male	Female
5241	General	7 and 8	4	401	Male	Male
5245	General	7 and 8	4	401	Male	Male
5269	General	7 and 8	9	401	Female	Female

Session ID	Class Subject	Year Level	Years Teaching	School Code	Gender of Teacher	Gender of Student
5332	General	7 and 8	4	401	Male	Male
5336	General	7 and 8	9	401	Female	Female
5257	General	7 and 8	22	403	Female	Male
5261	General	7 and 8	22	403	Female	Male
5265	General	7 and 8	22	403	Female	Female
5302	General	7 and 8	10	403	Female	Female
5306	General	7 and 8	10	403	Female	Male
5311	General	7 and 8	18	403	Female	Female
5315	General	7 and 8	18	403	Female	Female
5319	General	7 and 8	22	403	Female	Female
5323	General	7 and 8	8	403	Male	Female
5328	General	7 and 8	8	403	Male	Male
5086	Maths	9	17	402	Male	Male
5092	Religious Studies	9	23	402	Male	Male
5112	Maths	9	18	402	Female	Male
5162	Maths	9	18	402	Female	Male
5214	Maths	9	18	402	Female	Male
5193	Maths	9	17	402	Male	Male
5229	Maths	10	17	402	Male	Male
5094	Religious Studies	10	23	402	Male	Male
5115	English	10	26	402	Female	Male
5123	Maths	10	9	402	Female	Male
5135	Maths	10	9	402	Female	Male
5221	Maths	10	18	402	Female	Male
5218	Maths	10	5	402	Female	Male
5185	Maths	10	18	402	Female	Male
5208	Maths	10	17	402	Male	Male
5418	Maths	10	9	402	Female	Male
5419	Maths	10	9	402	Female	Male
5450	Maths	10	9	402	Female	Male
5462	Maths	10	9	402	Female	Male
5078	Maths	11	17	402	Male	Male
5178	English	11	31	402	Female	Male
5191	English	11	31	402	Female	Male
5119	English	11 and 12	26	402	Female	Male
5076	Maths	12	17	402	Male	Male

Session ID	Class Subject	Year Level	Years Teaching	School Code	Gender of Teacher	Gender of Student
5131	English	12	26	402	Female	Male
5137	Maths	12	18	402	Female	Male
5222	Maths	12	18	402	Female	Male
5442	English	12	26	402	Female	Male
5090	Maths	13	17	402	Male	Male
5102	Maths	13	43	402	Male	Male
5420	Maths	13	43	402	Male	Male
5451	Maths	13	43	402	Female	Male

Total Schools = 6

Total Sessions = 72

Number of Teachers = 26

Number of Students = 62

Teaching Experience:
Mean = 16.45
Median = 17
Range = 4–43 years

Gender of Teachers:
Male = 30
Female = 42

Gender of Students:
Male = 55
Female = 17

Year 7 and 8 Classes (Intermediate) Differentiated.

401 (Sole Purpose School):

Table A3.2 Year 7 and 8 Classes – Sole Purpose Intermediate School (401) Showing Teacher Experience

Class	Year of Class	Years Teaching	Sex of Teacher	Sex of Student	Session ID
Art	7 and 8	12	Male	Male	5007
Art	7 and 8	12	Male	Male	5327
Art	7 and 8	12	Male	Male	5351
Art	7 and 8	12	Male	Male	5370
General	7 and 8	9	Female	Female	5098
General	7 and 8	15	Female	Female	5100
General	7 and 8	4	Male	Female	5199
General	7 and 8	4	Male	Female	5201
Art	7 and 8	12	Male	Male	5210
Art	7 and 8	12	Male	Female	5212
General	7 and 8	4	Male	Male	5241
General	7 and 8	4	Male	Female	5245
General	7 and 8	9	Female	Male	5269
General	7 and 8	4	Male	Male	5332
General	7 and 8	9	Female	Male	5336

mean = 8.93	
median = 9	
range = 4-15 years	

405 (Composite School):

Table A3.3 Year 7 And 8 Classes – Composite School (405) Showing Teacher Experience

Class	Year of Class	Years Teaching	Sex of Teacher	Sex of Student	Session ID
General	7 and 8	21	Female	Male	5406
General	7 and 8	21	Female	Male	5070
General	7 and 8	21	Female	Male	5380
General	7 and 8	28	Male	Male	5411
General	7 and 8	28	Male	Male	5416
General	7 and 8	28	Male	Male	5072

mean = 24.5
median = 21
range = 21-28 years

403 (Sole Purpose School):

Table A3.4 Year 7 And 8 Classes - Sole Purpose Intermediate School (403) Showing Teacher Experience

Class	Year of Class	Years Teaching	Sex of Teacher	Sex of Student	Session ID
General	7 and 8	22	Female	Male	5257
General	7 and 8	22	Female	Male	5261
General	7 and 8	22	Female	Female	5265
General	7 and 8	10	Female	Female	5302
General	7 and 8	10	Female	Male	5306
General	7 and 8	18	Female	Female	5311
General	7 and 8	18	Female	Female	5315
General	7 and 8	22	Female	Male	5319
General	7 and 8	8	Male	Female	5323
General	7 and 8	8	Male	Female	5328

mean = 16	
median = 18	
range = 8-22 years	

404 (Composite School):

Table A3.5 Year 7 and 8 Classes – Composite Intermediate School (404) Showing Teacher Experience

Class	Year of Class	Years Teaching	Sex of Teacher	Sex of Student	Session ID
General	7 and 8	12	Male	Male	5282
General	7 and 8	12	Male	Female	5286
General	7 and 8	12	Male	Male	5290
General	7 and 8	21	Female	Female	5294
General	7 and 8	21	Female	Female	5298

mean = 15.6
median = 12
range = 12-21 years

Appendix 4

Inter Observer Agreement

Table A4.1 Inter Observer Agreement

Behaviour Code:	minimum value	lower quartile	median	upper quartile	maximum value	mean
201	85.92	92.96	100	100	100	97.8
202	66.52	79.085	91.65	95.825	100	91.31
203	70.43	83.665	96.9	98.45	100	95.4
204	85.21	92.605	100	100	100	98.01
205	82.93	91.465	100	100	100	98.23
206	78.2	89.1	100	100	100	97.25
207	70.88	85.44	100	100	100	94.82
208	100	100	100	100	100	100
209	84.3	92.15	100	100	100	98.29
210	90.44	95.22	100	100	100	99.04
220	79.71	89.855	100	100	100	97.37
221	50.09	68.345	86.6	93.15	99.7	85.79
230	88.14	94.07	100	100	100	98.81
231	67.45	81.815	96.18	98.09	100	95.06
240	89.6	94.8	100	100	100	98.96
241	81.81	90.905	100	100	100	96.66
250	97.59	98.795	100	100	100	99.75
251	62.13	78.565	95	97.5	100	93.92
260	98	99	100	100	100	99.8
261	74.38	87.19	100	100	100	96.79
270	86.8	93.4	100	100	100	98.45
271	68.7	82.685	96.67	98.335	100	94.31
280	100	100	100	100	100	100
281	88.67	94.335	100	100	100	98.87
290	100	100	100	100	100	100
291	95	97.5	100	100	100	99.5
298	100	100	100	100	100	100
299	100	100	100	100	100	100
301	82.08	89.065	96.05	98.025	100	95.76
302	87.17	93.585	100	100	100	98.49
303	95.93	97.965	100	100	100	99.59
304	87.5	93.75	100	100	100	98.75
305	92.41	96.205	100	100	100	99.01
306	88.51	94.255	100	100	100	98.67
307	92.86	96.43	100	100	100	99.28
308	83.33	91.665	100	100	100	98.33
311	90.43	95.215	100	100	100	98.94
320	75.32	87.66	100	100	100	95.29
330	77.79	87.645	97.5	98.75	100	95.51
340	90	95	100	100	100	98.36
350	100	100	100	100	100	100
360	89	94.5	100	100	100	98.7
370	100	100	100	100	100	100

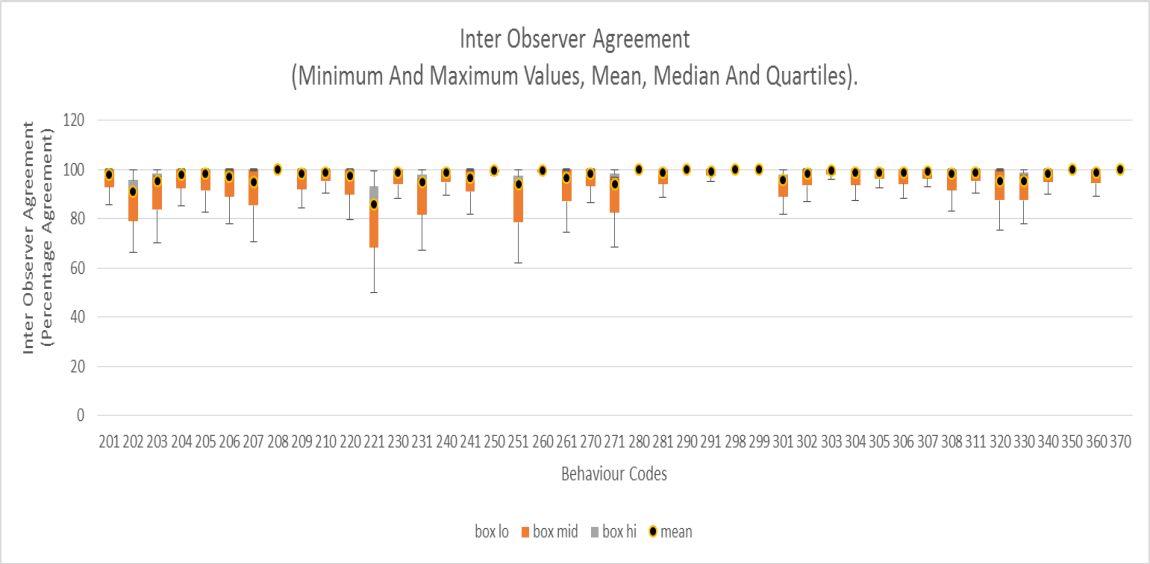
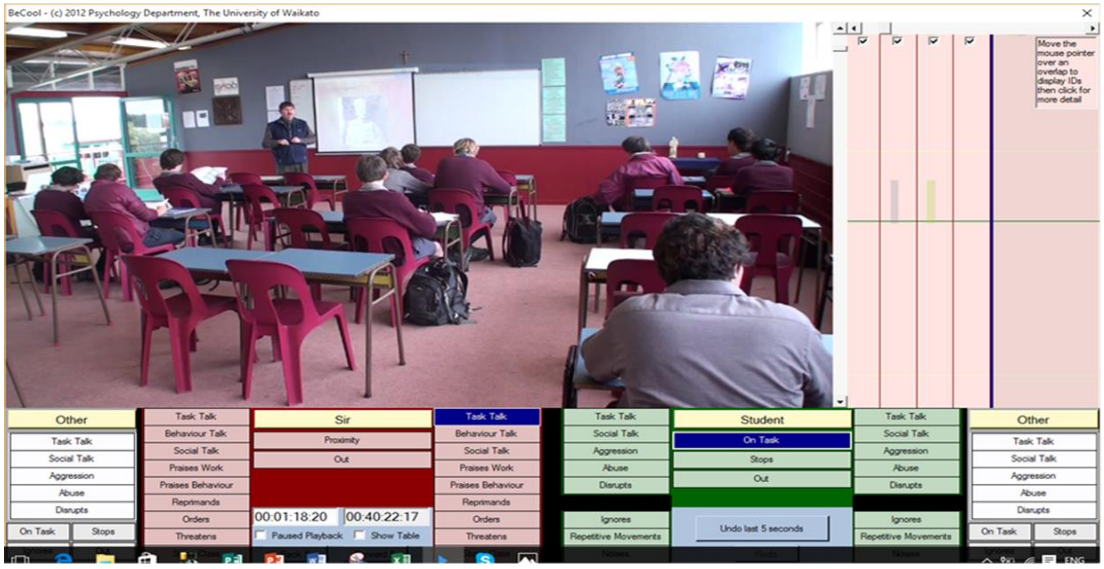


Figure A4.7.4.1 Inter Observer Agreement

Appendix 5

The Programme



Behaviours of interest were configured to enable a natural flow to recording with the Teacher and Target student as focal.

It was possible to arrange recording keys such that mutually exclusive behaviour could not record at the same time e.g. teacher task talk terminated teacher social talk automatically, also for student behaviour, etc.

Teacher behaviour to the right of 'Sir' was directed toward the Target student, to the left, to Other student(s), a left click on the teacher behaviour indicated talk to the whole class.

The recording system was arranged with identical behaviours for the target student and other students and the Teacher toward the Target student or Other students.

An undo 5 second button was included which cleared (erased) the previous 5 seconds recordings to begin again, such that errors could be readily corrected or definition uncertainties clarified.

The programme was designed for the continuous recording of behaviour with data outputted in to chosen variable interval durations (e.g. two, three or five minute, shorter or longer). Data identifiers were allotted to the different variables measured in the study viz.

Session ID i.e. video recording

Individual behaviour ID's. for all teacher and student behaviour recorded

School ID, decile rating, type (composite, Primary, Intermediate, Secondary)

Class ID, name (general, maths, art, etc.)

Teacher ID, gender, years experience.

Teacher behaviour recorded included: Task talk, Behaviour talk, Social talk, Praise for work, Praise for behaviour, Reprimands, Orders, Threats, Proximity to the Target student and in or out of class. Identical records were made for teacher verbal behaviour whether directed toward the Target student or other students.

Allotting IDs to the different variables at the outset enabled the ready creation of a data base including all, and enabled the ready extraction of specific information or data.

No programmes were available at the time of the study that enabled the extraction of continuous behaviour records from video data.

The programme was developed from the 'ground up' as the best wish for the current study, literally from – 'draw me a picture and I will make it work.'

It is innovative in its entirety, and capable of being configured in different ways to best capture and analyse data.

The current study would not have been possible without this programme.